

REPORT NUMBER: 201U-VER-04-07

**SAFETY COMPLIANCE TESTING FOR FMVSS 201  
OCCUPANT PROTECTION IN INTERIOR IMPACT  
UPPER INTERIOR HEAD IMPACT PROTECTION**

**VOLKSWAGEN AG GERMANY  
2004 VOLKSWAGEN TOUAREG**

NHTSA NUMBER: C45800

GD TEST NUMBER: 8730-07

**ADVANCED INFORMATION ENGINEERING SERVICES  
A GENERAL DYNAMICS COMPANY  
TRANSPORTATION SCIENCES CENTER  
P.O. BOX 400  
BUFFALO, NEW YORK 14225**



Test Date: February 16, 2004

**FINAL REPORT**

**PREPARED FOR:**

**U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Enforcement  
Office of Vehicle Safety Compliance  
Mail Code: NVS-220, Room 6111  
400 Seventh Street, SW  
Washington, DC 20590**

This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by:

  
James Czarniecki, Project Engineer

Approved by:

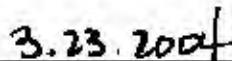
  
David J. Trafale, Program Manager  
Transportation Science Center

Approval Date:

  
March 9, 2004

FINAL REPORT ACCEPTANCE BY:

  
NHTSA, Office of Vehicle Safety Compliance

  
3.23.2004

Date of Report Acceptance

# **TECHNICAL REPORT STANDARD TITLE PAGE**

1. Report No. 201U-VER-04-07		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 201 Compliance Testing of a 2004 Volkswagen Touareg, NHTSA No. C45800		5. Report Date / Final Test Date  February 16, 2004		6. Performing Organization Code VER	
		8. Performing Organization Report No. 8730-07			
7. Author(s) David J. Travale, Program Manager James Czarniecki, Project Engineer		10. Work Unit No.		11. Contract or Grant No. DTNH22-99-C-01005	
9. Performing Organization Name and Address Advanced Information Engineering Services A General Dynamics Company 4455 Genesee Street Buffalo, New York 14225		13. Type of Report and Period Covered Final Report  February 2004		14. Sponsoring Agency Code NVS-220	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance Mail Code: NVS-220 400 Seventh, SW, Room 6111 Washington, D.C. 20590		15. Supplementary Notes			
16. Abstract  Compliance tests were conducted on the subject vehicle, a 2004 Volkswagen Touareg, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows in the table below:					
Target Point	Horizontal	Vertical	Velocity	HIC	HICd
None	-	-	-	-	-
None	-	-	-	-	-
17. Key Words Compliance Testing Safety Engineering FMVSS 201			18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, DC 20590 Telephone No.: 202-366-4946		
19. Security Classif. (of this report) UNCLASSIFIED		20. Security Classif. (of this page) UNCLASSIFIED		21. No. of Pages	22. Price

Form DOT F1700.7 (8-69)

## TABLE OF CONTENTS

SECTION		PAGE
1	PURPOSE AND TEST PROCEDURE	I-1
2	SUMMARY OF UPPER INTERIOR HEAD IMPACTS	2-1
3	SUMMARY OF TEST RESULTS AND DATA PLOTS	3-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT	B-1



### LIST OF DATA SHEETS

DATA SHEET	DESCRIPTION	PAGE NO.
2-1	SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS	2-2
2-2	GENERAL TEST AND VEHICLE PARAMETER DATA	2-3
2-3	TARGET MEASUREMENT REFERENCE SHEET	2-5
2-4	APPROACH ANGLE LIMITS	2-6
2-5	TARGET IMPACT LOCATION ON FMH SUMMARY	2-7

## **SECTION 1**

### **PURPOSE AND TEST PROCEDURE**

This head impact compliance test is part of the FMVSS 201 Upper Interior Head Impact Protection Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-99-C-01005. The purpose of this head impact compliance test was to determine whether the subject vehicle, 2004 Volkswagen Touareg 4-door, NHTSA No. C45800, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact. The compliance test was conducted in accordance with the OVSC Laboratory Test Procedure No. TP-201U-01 dated April\_03, 1998.

## SECTION 2

### SUMMARY OF UPPER INTERIOR HEAD IMPACTS

A 2004 Volkswagen Touran, NHTSA No. C45800, was impacted at various locations throughout its upper interior by a 4.54 kg 50<sup>th</sup> percentile headform. A total of ten (10) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officer's Technical Representative (COTR). A summary of test results can be found on data sheet 2-1. The ten (10) area chosen for testing were:

BP4	QP1	BP3	URBP	AP1
SR2B	BP2	URBP	URBP	AP2

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201.

Five Free Motion Headforms (FMH), were used in this test series. All five FMH's were calibrated prior to and after the test series. Calibration information are included in Appendix B. Each FMH weighed  $4.54 \pm 0.5$  kg and has an orthogonal tri-axis accelerometer pack mounted at the center of gravity (c.g.).

A total of three (3) channels of data for each target impact test are recorded on a Keyser-Threde data acquisition system. Data plots, along with still photographs, can be found in Section 3 of this report.

To document each target area impact test, one Weinberger high-speed video camera was placed at various locations to view the headform contact with the selected target area.

# DATA SHEET 2-1

## SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	05/03 (SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

TARGET CODE	Target Coordinates						Approach Angles (degrees)		Velocity (lph)	FMH HIC	HIC(d)
	Driver Side			Passenger Side			Horizontal	Vertical			
	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Z(mm)					
AP1	1279.0	-600.9	1164.3	1278.3	603.8	1159.0	127	48	18.48	788.7	761.3
AP2	1082.9	-644.3	1076.3	1077.3	644.4	1071.3	207	43	18.65	526.2	563.4
AP3	970.1	-661.3	1013.6	975.8	662.8	1013.2	-	-	-	-	-
BP1	1811.7	-333.0	1242.0	1816.3	337.9	1233.7	-	-	-	-	-
BP2	1804.7	-633.8	1006.5	1799.5	634.0	1006.0	270	3	23.57	1034.4	961.9
BP3	1720.4	-666.4	1029.2	1723.7	668.2	1023.7	83	-4	23.54	700.7	695
BP4	1843.2	-708.0	914.6	1884.5	708.4	918.9	133	-5	23.45	870.3	823
FH1	1204.9	-507.0	1217.6	1207.9	508.7	1211.8	Relocated 1 time		-	-	-
Rel. FH1	1224.2	-499.4	1200.6	1219.9	500.2	1196.5	-	-	-	-	-
FH2	1185.0	-362.4	1223.2	1194.5	356.1	1222.2	Relocated 1 time		-	-	-
Rel. FH2	1203.7	-352.2	1207.8	1208.7	355.3	1202.8	-	-	-	-	-
OP1	2651.9	-639.6	995.4	2654.3	646.4	993.0	90	3	23.6	620.6	634.6
OP2	2649.2	-648.3	1026.9	2649.8	634.1	1024.4	-	-	-	-	-
RP1	3107.3	-330.1	1123.3	3114.6	331.6	1117.3	-	-	-	-	-
SR1	1423.8	-330.0	1213.7	1431.7	349.3	1209.6	Relocated 1 time		-	-	-
Rel. SR1	1402.6	-331.2	1204.4	1409.4	348.7	1204.3	-	-	-	-	-
SR2A	1580.7	-334.6	1248.4	1585.9	333.1	1242.2	Relocated 2 times		-	-	-
Rel. SR2A	1578.9	-311.8	1231.3	1582.3	313.8	1233.7	-	-	-	-	-
SR2B	1507.3	-335.6	1241.4	1513.0	333.4	1237.4	Relocated 2 times		-	-	-
Rel. SR2B	1511.9	-315.5	1226.4	1515.1	314.9	1222.5	90	48	18.35	352.5	432.4
SR3	2198.0	-330.0	1232.3	2206.8	328.1	1231.9	-	-	-	-	-
URAP	1436.0	-430.3	1244.1	1437.4	449.4	1241.1	-	-	-	-	-
URBP Driver	1811.6	-430.4	1268.1	1812.3	449.7	1264.6	90	30	23.47	1014.2	931.6
URBP Passenger							270	50	23.56	942.3	877.3
URDP	2580.7	-442.8	1259.5	2579.6	443.3	1251.4	270	47	23.81	507.4	549.2
URRP	2943.5	-448.8	1177.4	2950.6	431.8	1169.2	-	-	-	-	-

\*HIC(d)=0.73446(Free Motion Headform HIC)+166.4

Rear Pillar and Rear Header excluded per s6.3(b)

VW's reference point for x,y,z coordinate correlation (Driver side front outboard seat belt hole: x=1173 mm, y=-570 mm, and z=213 mm) to General Dynamic's coordinate system.

## DATA SHEET 2-3

### GENERAL TEST AND VEHICLE PARAMETER DATA

<b>TEST VEHICLE INFORMATION:</b>									
Year/Make/Model/Body Style:					2004 Volkswagen Touareg				
VIN:					WVGBC67L64D003224				
Month & Year of Manufacture:					05/03(SEE CERTIFICATION LABEL)				
Vehicle Body Color:					Wheat Beige				
Engine Data:	6	Cylinders:	195	CID:	3.2	Liters:	-	cc	
Engine Placement:	-		Longitudinal:	or		x	Lateral		
Transmission:	6	Speed:	-	Manual:	x	Automatic:	-	Overdrive	
Final Drive:	-	Rear Wheel Drive:	-	Front Wheel Drive:	x	Four Wheel Drive			
Odometer Reading:	354		km						
Options:	x	A/C:	x	Power Steering:	x	Pwr.Brakes:	x	Pwr. Windows	
Interior Trim Information :									
1. B-Pillar has adjustable seat anchorages									
2. Other pillar has adjustable seat anchorages									
3. Front and rear outboard seating positions have grab handles located on the side rails									

<b>DATA FROM TIRE PLACARD:</b>									
Tire Pressure (at capacity):					250	kPa FRONT			
					250	kPa REAR			
Recommended Tire Size:					P255/60R17				
Tires on Test Vehicle:			P255/60R17		Manufacturer:			Dunlop	
Vehicle Capacity Data:									
Number of Occupants:	2	Front:	3	Rear:	-	3rd Seat:	5	Total	
Type of Front Seats:	x	Bucket:	-		Bench:	-		Split Bench	
Type of Front Seat Back:	-	Fixed:	x	Adjustable with	-	Lever or	x	Knob	
Vehicle Capacity Weight (VCW)=					476	kg (A)			
No. of Occupants x 68 kg. =					340	kg (B)			
Rated Cargo/Luggage Weight (RCLW) =					136	kg (A-B) Max. RCLW = 136 kg.			

## DATA SHEET 2-2

### GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:					
Left Front	=	591	kg	Left Rear	= 553 kg
Right Front	=	604	kg	Right Rear	= 551 kg
TOTAL FRONT	=	1195	kg	TOTAL REAR	= 1104 kg
% of Total Weight	=	52.0	%	% of Total Weight	= 48.0 %
TOTAL WEIGHT	=	2299	kg		

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:		
Total Test Vehicle Delivered Weight=	2299	kg (A)
+ Rated Cargo/Luggage Weight =	136	kg (B)
TEST VEHICLE TARGET WEIGHT =	2435	kg (A+B)

WEIGHT OF TEST VEHICLE (FULLY LOADED):					
Left Front	=	588	kg	Left Rear	= 631 kg
Right Front	=	581	kg	Right Rear	= 630 kg
TOTAL FRONT	=	1169	kg	TOTAL REAR	= 1261 kg
% of Total Weight	=	48.1	%	% of Total Weight	= 51.9 %
TOTAL TEST WEIGHT	=	2430			
Weight of vehicle secured in test vehicles cargo area	=	136	kg		

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	899	Left Rear	898
	Right Front	891	Right Rear	899
FULLY LOADED:	Left Front	891	Left Rear	875
	Right Front	891	Right Rear	876
Test Vehicle Wheelbase:		2845		millimeters

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.61	Front Bumper	0.11
	Right Door Sill	0.61	Rear Bumper	0.21
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.11	Front Bumper	0.0
	Right Door Sill	0.21	Rear Bumper	0.31
AS TESTED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.21	Front Bumper	0.11
	Right Door Sill	0.41	Rear Bumper	0.21

**DATA SHEET 2-3**  
**TARGET MEASUREMENT REFERENCE SHEET**

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	05/03 (SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Measurements	Description	Left Side	Right Side
M	Seat fore / Aft travel (Front seats)	247	247
T°	Horizontal angle {CG-F1 (Left seat) to (Right A-pillar)}	110	-
A1°	360° - T°	250	-
W°	Horizontal angle {CG-F2 (Left seat) to (Left A-pillar)}	201	-
A2°	A2° = W°	201	-
U°	Horizontal angle {CG-F2 (Left seat) to (Left B-pillar)}	281	-
B1°	B1° = U°	281	-
V°	Horizontal angle {CG-FR (Left seat) to (Right B-pillar)}	201	-
B2°	B2° = V°	201	-
W°	Horizontal angle {CG-F2 (Right seat) to (Right A-pillar)}	-	159
A1°	A1° (Right) = W° (Right)	-	159
T°	Horizontal angle {CG-F1 (Right seat) to (Left A-pillar)}	-	250
A2°	360° - T° (Right)	-	110
V°	Horizontal angle {CG-FR (Right seat) to (Right B-pillar)}	-	159
B1°	B1° (Right) = V° (Right)	-	159
U°	Horizontal angle {CG-F2 (Right seat) to (Right B-pillar)}	-	81
B2°	B2° (Right) = U° (Right)	-	81
J	A-pillar {(Plane 3) - (Plane 5)}	300	298
J/2	J ÷ 2	150	149
D1	Upper Roof {(Plane A) - (Plane B)}	2180	
D1/2	D1 ÷ 2	1090	
D2	Upper Roof {(Plane C) - (Plane D)}	1298	
D2/2	D2 ÷ 2	649	
.35D1	.35 x D1	763	
.35D2	.35 x D2	454.3	
N	B-pillar {(BPR) - (lowest point on the daylight opening forward of B-pillar)}	426	428
N/2	B-pillar {(BP3) - (lowest point on the daylight opening forward of B-pillar)}	213	214
N/4	B-pillar {(BP3) - (lowest point on the daylight opening forward of B-pillar)}	106.5	107
Q	Other-pillar {(OPR) - (lowest point on the daylight opening forward of O-pillar)}	394	396
Q/2	Other-pillar {(OP2) - (lowest point on the daylight opening forward of O-pillar)}	197	198
D	{{(Corner of roof area, point 7) - (roof area center, point M)}	916	916
3D/7	(3 x D) ÷ 7	392.5	392.5
MM	Widest door opening of slider door	-	-
M	MM ÷ 2	-	-

**DATA SHEET 2-4**  
**APPROACH ANGLE LIMITS**

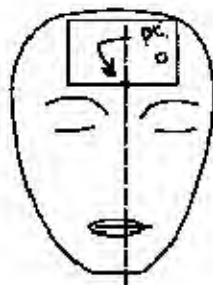
Left Side					Right Side				
Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)		Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	201	250	-5	48	AP1	110	159	-5	48
AP2	201	250	-5	43	AP2	110	159	-5	43
AP3	201	250	-5	40	AP3	110	159	-5	40
BP1	201	281	-10	15	BP1	81	159	-10	15
BP2	ANY		0	3	BP2	ANY		0	3
BP3	201	281	-10	-4	BP3	81	159	-10	-4
BP4	201	281	-10	-5	BP4	81	159	-10	-5
OP1	ANY		0	3	OP1	ANY		0	3
OP2	270		-10	0	OP2	90		-10	0
RP1	270	345	-10	-	RP1	15	90	-10	-
RP2	270	345	-10	-	RP2	13	90	-10	-
FH1	180		0	50	FH1	180		0	50
FH2	180		0	50	FH2	180		0	50
RH	360		0	-	RH	0		0	-
SR1	270		0	50	SR1	90		0	50
SR2A	270		0	48	SR2A	90		0	48
SR2B	270		0	48	SR2B	90		0	48
SR3	270		0	50	SR3	90		0	50
URAP	ANY		0	50	URAP	ANY		0	50
URBP	ANY		0	50	URBP	ANY		0	50
URRP	ANY		0	47	URRP	ANY		0	47
Note: BP2 and OP1 target locations – Seat belt anchorages Rear Pillar and Rear Header excluded per s6.3(b)									



# DATA SHEET 2-5

## SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	05/03 (SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige



κ RIGHT SIDE OF FACE

TARGET	Distance Above Point O (mm)	Distance Over From Pt. O (mm)
BP4	18	11 to the left
OP1	9	4 to the left
BP3	18	8 to the right
URBP	47	0
AP1	14	14 to the right
SR2B	30	0
BP2	11	4 to the left
UROP	29	4 to the left
URBP	53	7 to the left
AP2	12	9 to the right

**SECTION 3**  
**SUMMARY OF TEST RESULTS AND DATA PLOTS**

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	03/03 (SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	01
Test Date:	February 13, 2004
Target Location:	B-Pillar
Target Code:	BP4
Horizontal Impact Angle:	153°
Vertical Impact Angle:	-5°
Ambient Temperature:	22°C
Relative Humidity:	22%
Time of Impact:	10:00
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	11	<input type="checkbox"/>	mm right	<input checked="" type="checkbox"/> mm left
On Centerline	18		mm up	



POST-IMPACT BP4 HEADFORM

Free Motion HIC	823.0
HIC(d)	870.3
Impact Velocity (kph)	23.45
HIC T1 (msec)	3.1
HIC T2 (msec)	9.0

# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - BP4

PMH Headform 805

Location: BP4

Test Date: February 13, 2004

Work File: BP4

## TEST RESULTS

Lab Temperature: 22 C

HICd: 823.0

Lab Humidity: 22 %

HIC (36ms): 870.3

Velocity at Impact: 23.45 KPH

t1: 3.1 msec

t2: 9.0 msec

Free Flight Distance: 216.57 mm

Duration: 5.9 msec

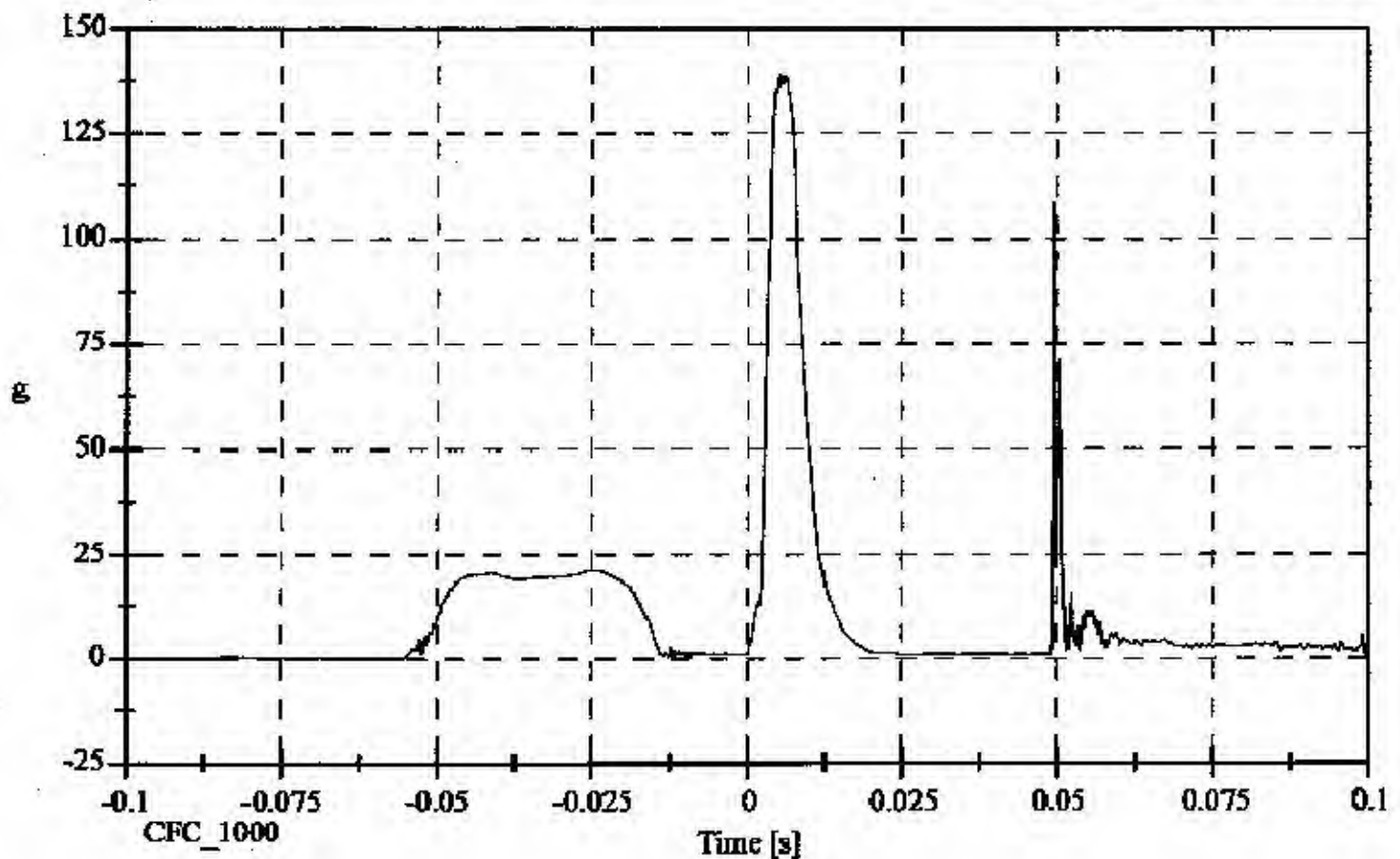
Average Acceleration: 9.6 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 139.1 [g] at 0.005 [s]

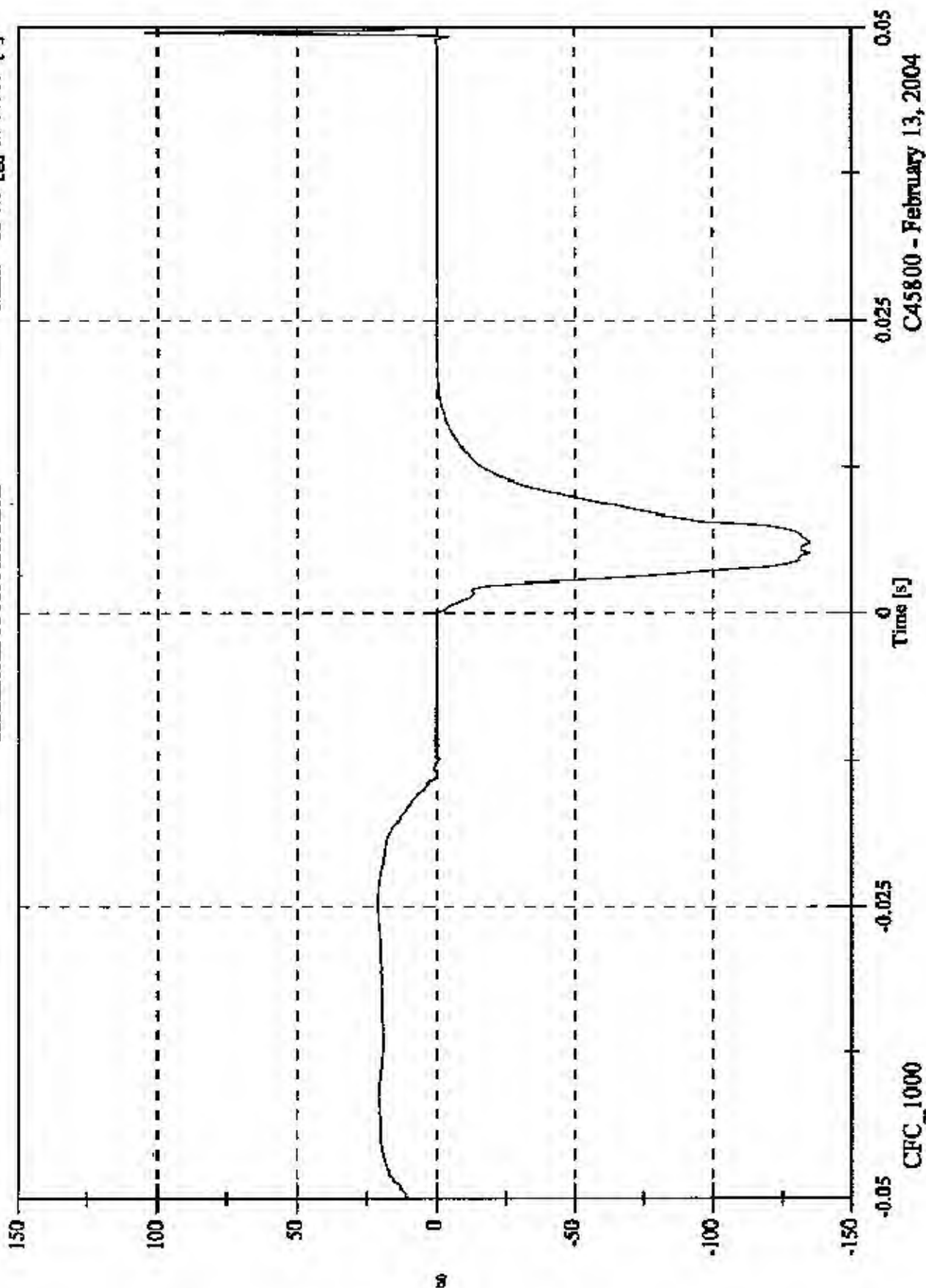
Min: -0.0 [g] at -0.099 [s]



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 104.4 [g] at 0.050 [s]  
Min: -134.5 [g] at 0.005 [s]

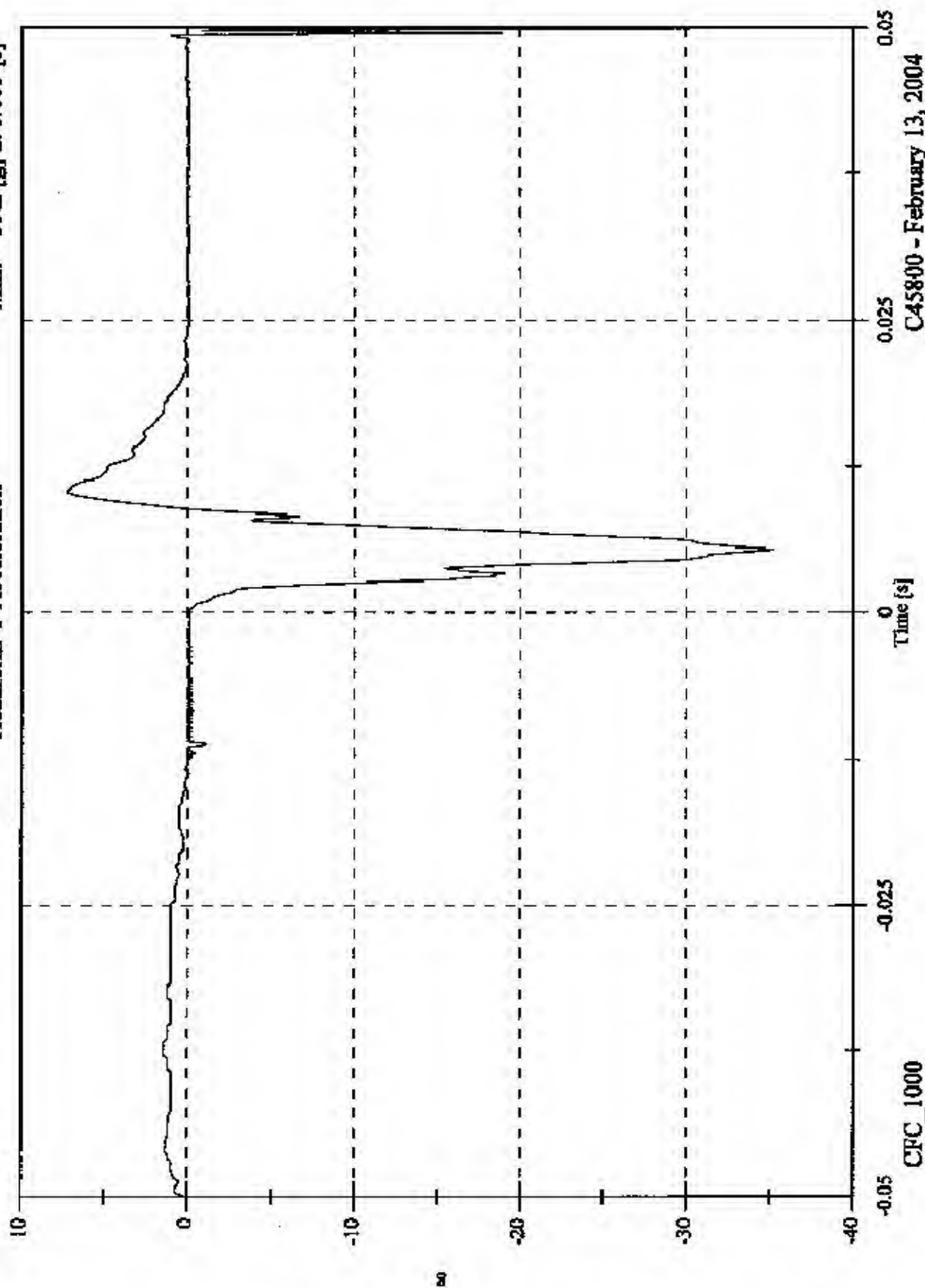


C45800 - February 13, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 7.3 [g] at 0.010 [s]  
Min: -35.2 [g] at 0.005 [s]

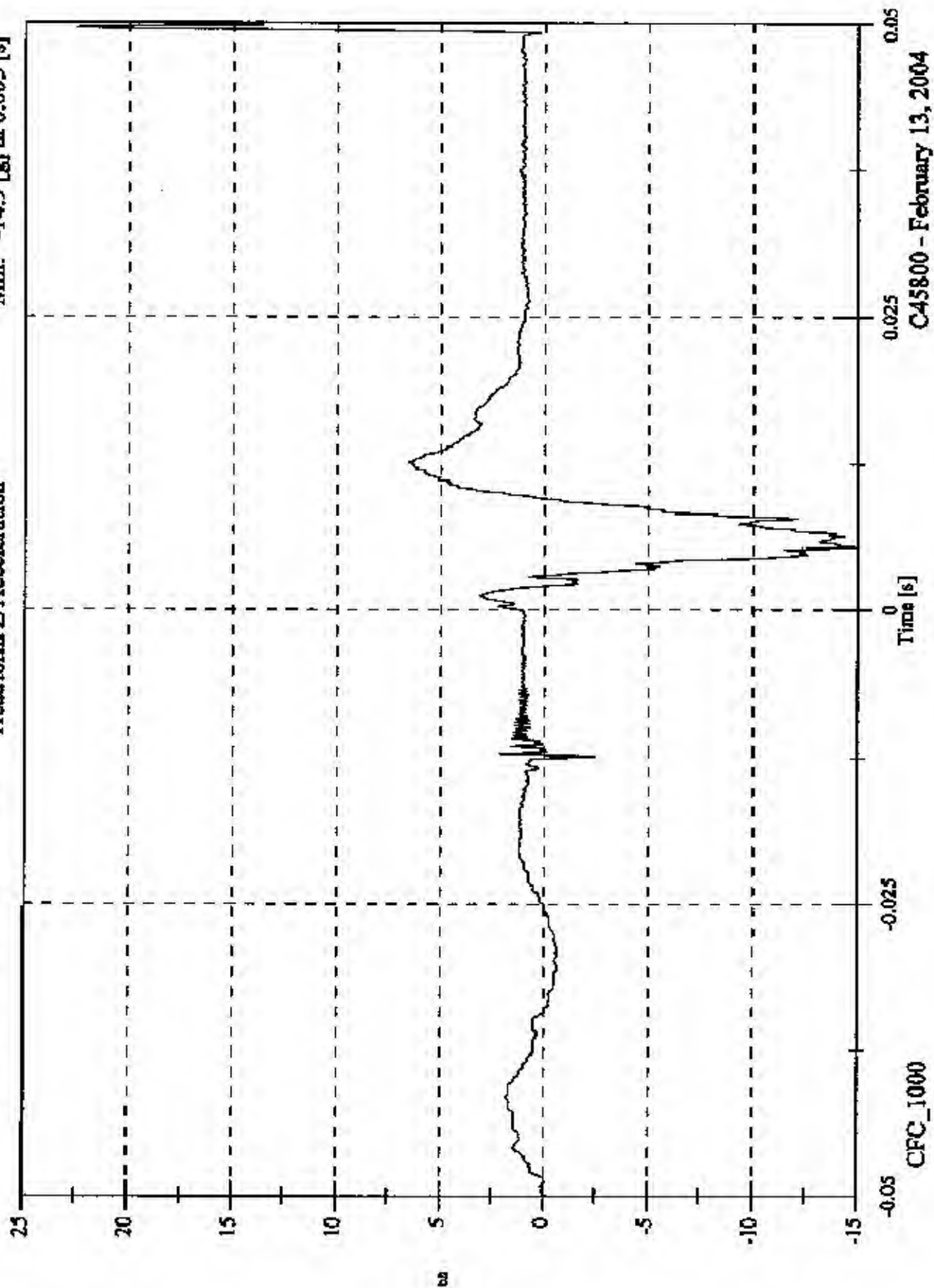


C45800 - February 13, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 24.0 [g] at 0.050 [s]  
Min: -14.9 [g] at 0.005 [s]

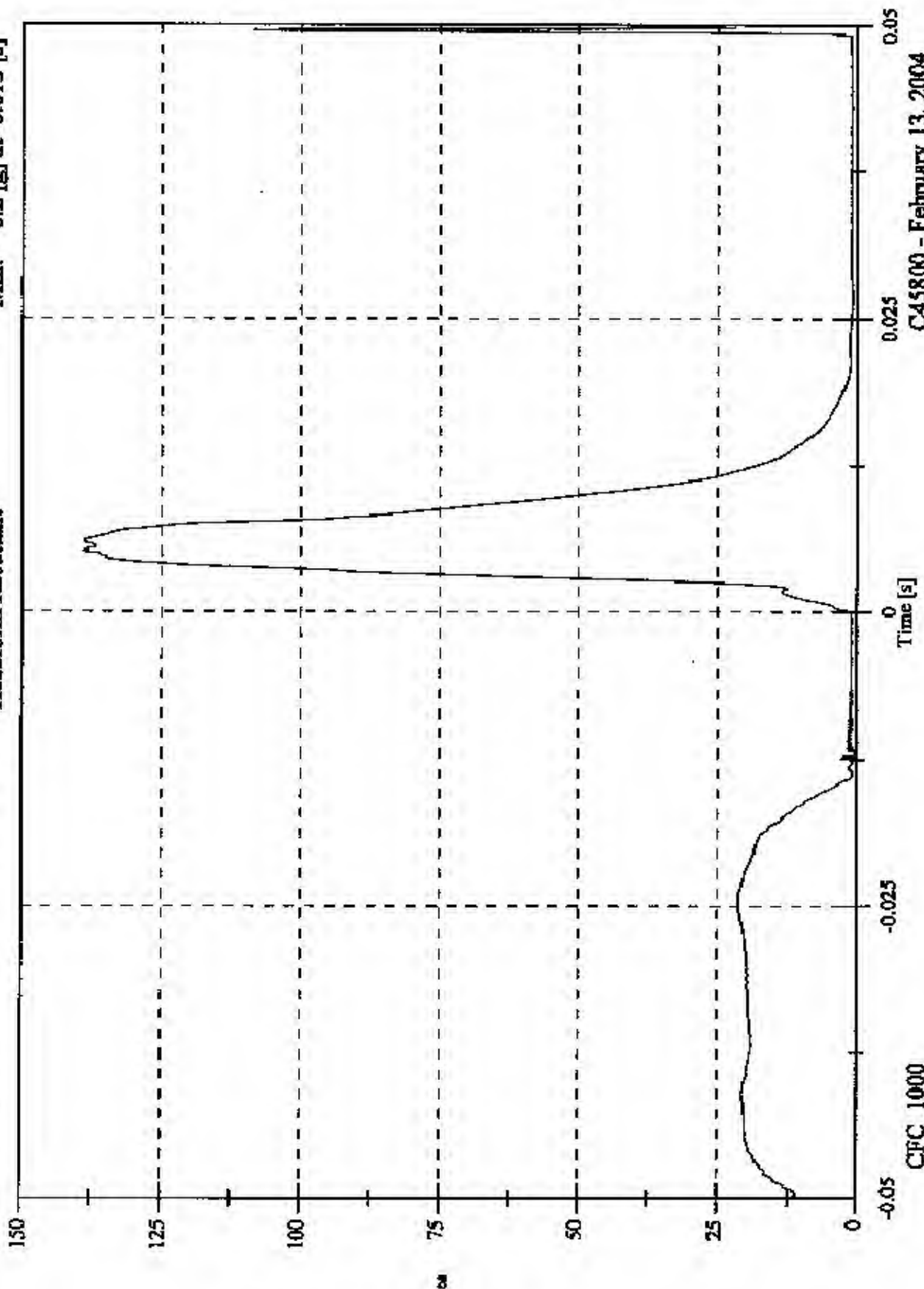


C45800 Passenger Side BP4 Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 139.1 [g] at 0.005 [s]  
Min: 0.2 [g] at -0.013 [s]

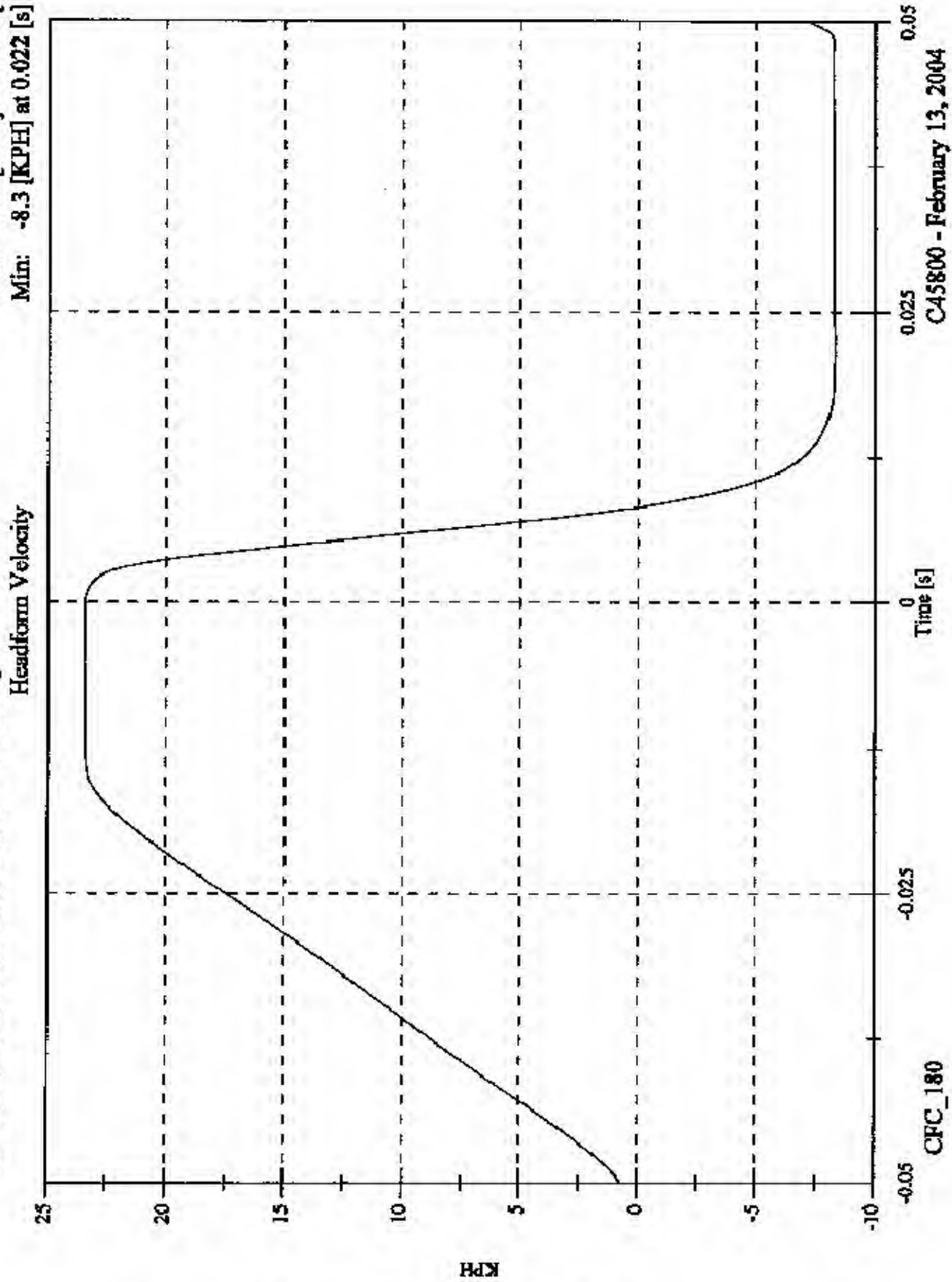


C45800 Passenger Side BP4 Impact Plot #4



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 23.5 [KPH] at -0.001 [s]  
Min: -8.3 [KPH] at 0.022 [s]



FM VSS 201U C45800  
04 VW TOLAREG BP4  
PRE TEST 13 FEB 04  
HOR 153 VER -5

PLEASE CONTACT BY

8419-17



FMVSS 207J C-250  
01 VW TOLAREG 8F4  
POST TEST  
HOR 153 VER 1.00004

POST-IMPACT 01

570-07

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	05/03(SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	02
Test Date:	February 13, 2004
Target Location:	Other Pillar / C-Pillar
Target Code:	OP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	3°
Ambient Temperature:	22°C
Relative Humidity:	22%
Time of Impact:	10:45
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	4	mm right	x	mm left
On Centerline	9	mm up		



POST-IMPACT OP1 HEADFORM

Free Motion HIC	620.6
HIC(d)	634.6
Impact Velocity (kph)	23.60
HIC T1 (msec)	2.8
HIC T2 (msec)	10.4

# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - OP1

FMH Headform 0355

Location: OP1

Test Date: February 13, 2004

Work File: OP1

## TEST RESULTS

Lab Temperature: 22 C

HICd: 634.6

Lab Humidity: 22 %

HIC (36ms): 620.6

Velocity at Impact: 23.60 KPH

t1: 2.8 msec

t2: 10.4 msec

Free Flight Distance: 220.55 mm

Duration: 7.5 msec

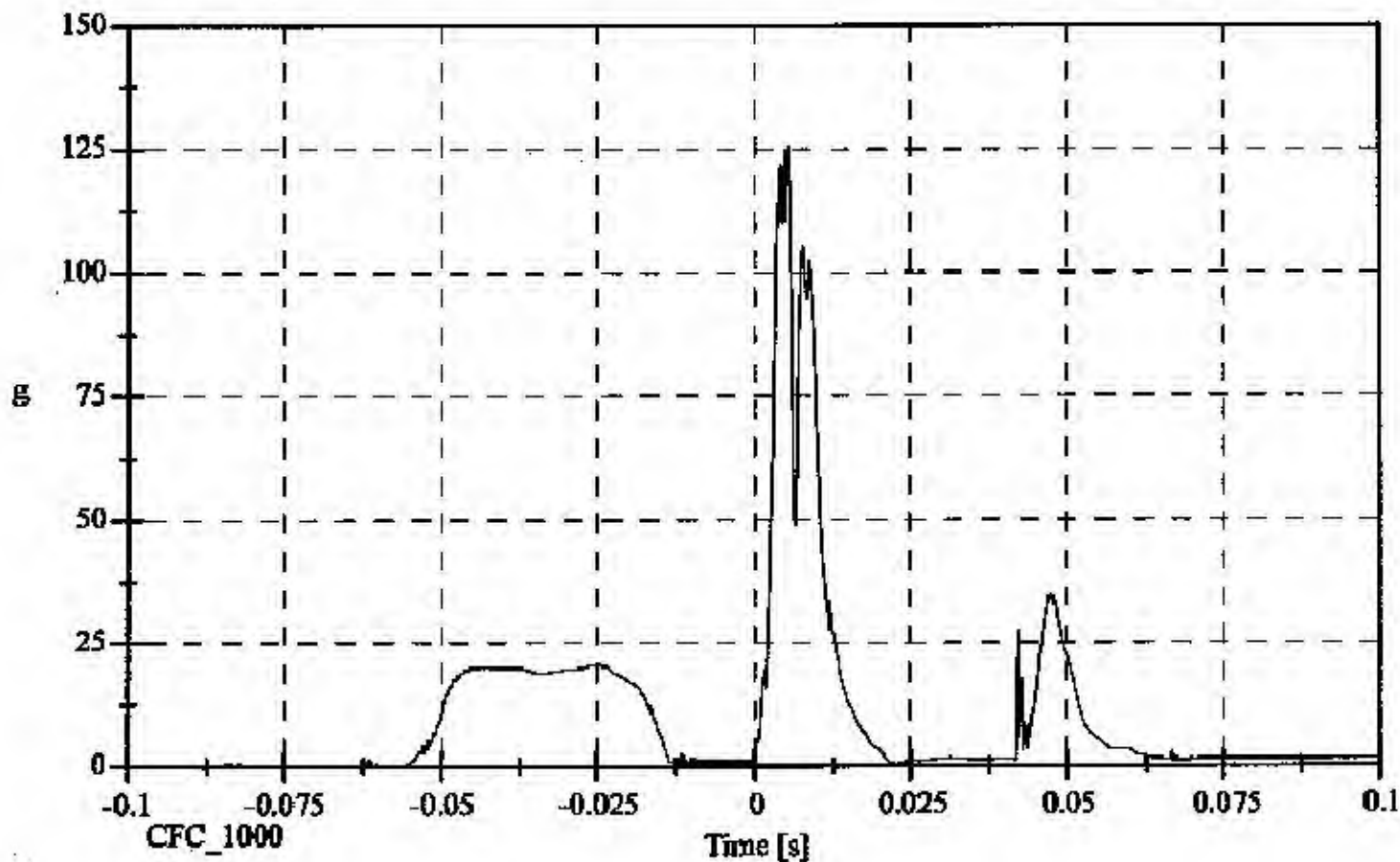
Average Acceleration: 9.7 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 125.9 [g] at 0.005 [s]

Min: 0.0 [g] at -0.087 [s]

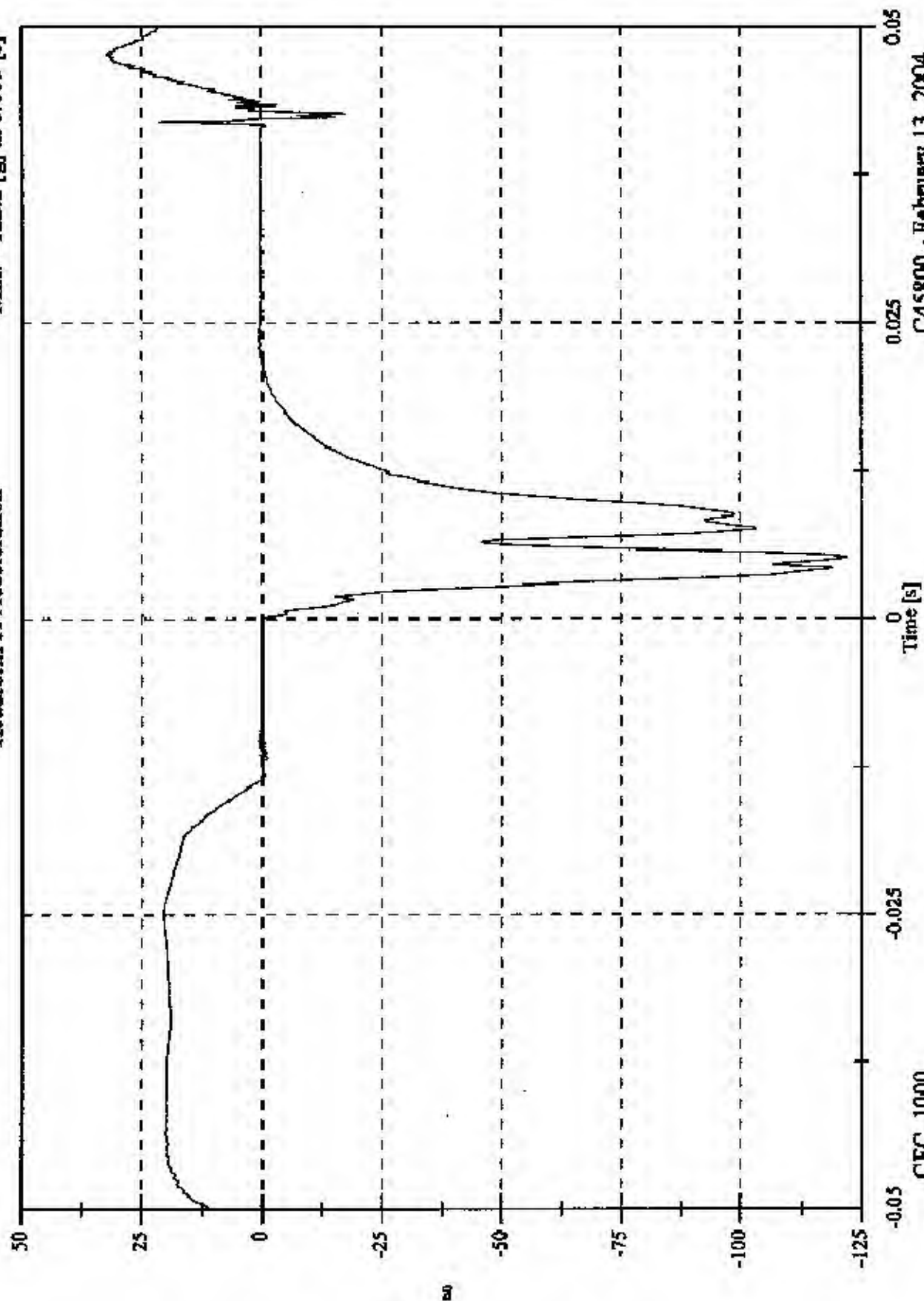




FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 32.3 [g] at 0.048 [s]  
Min: -122.2 [g] at 0.005 [s]



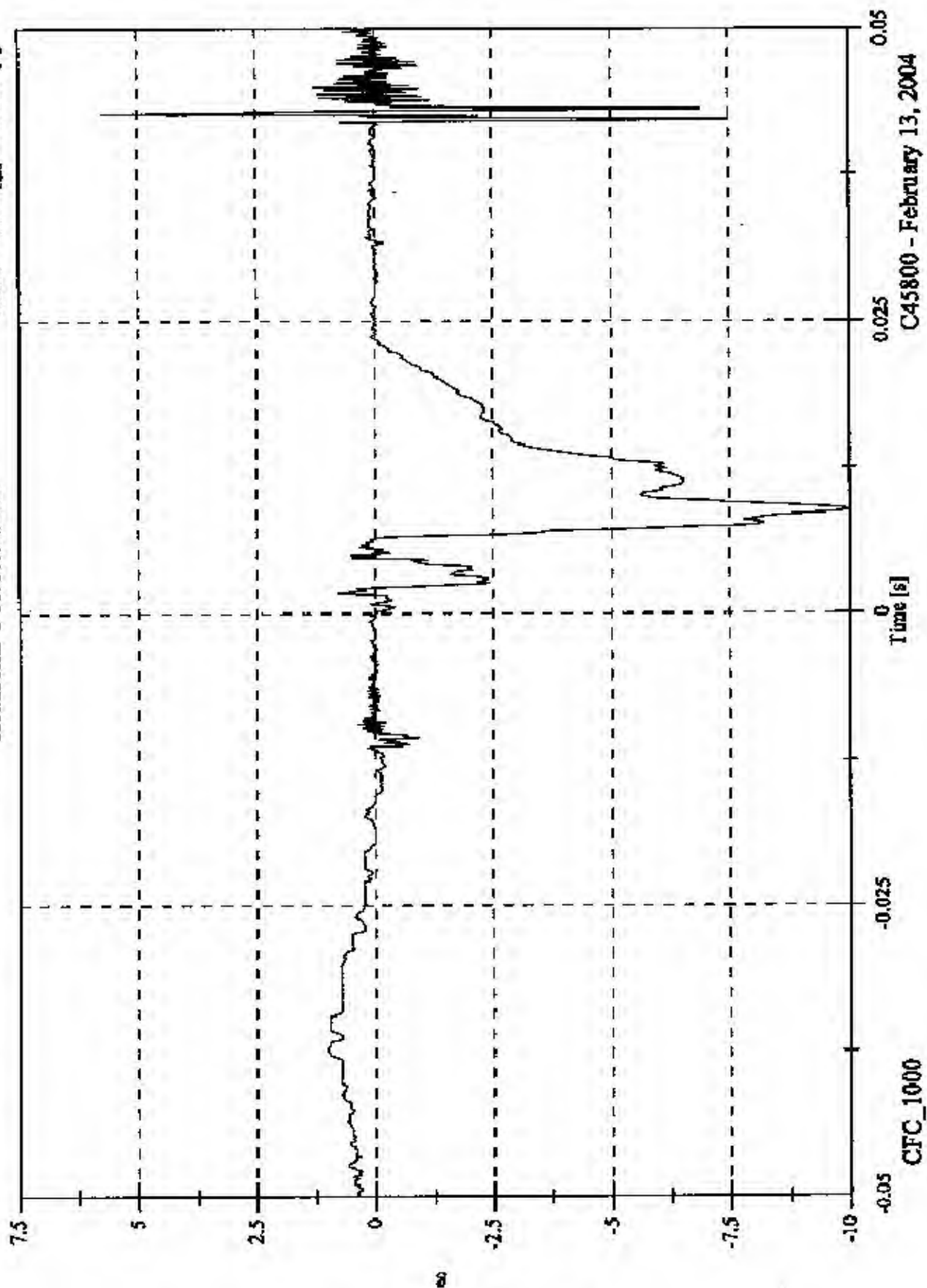
C45800 - February 13, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 5.7 [g] at 0.043 [s]

Min: -10.0 [g] at 0.009 [s]

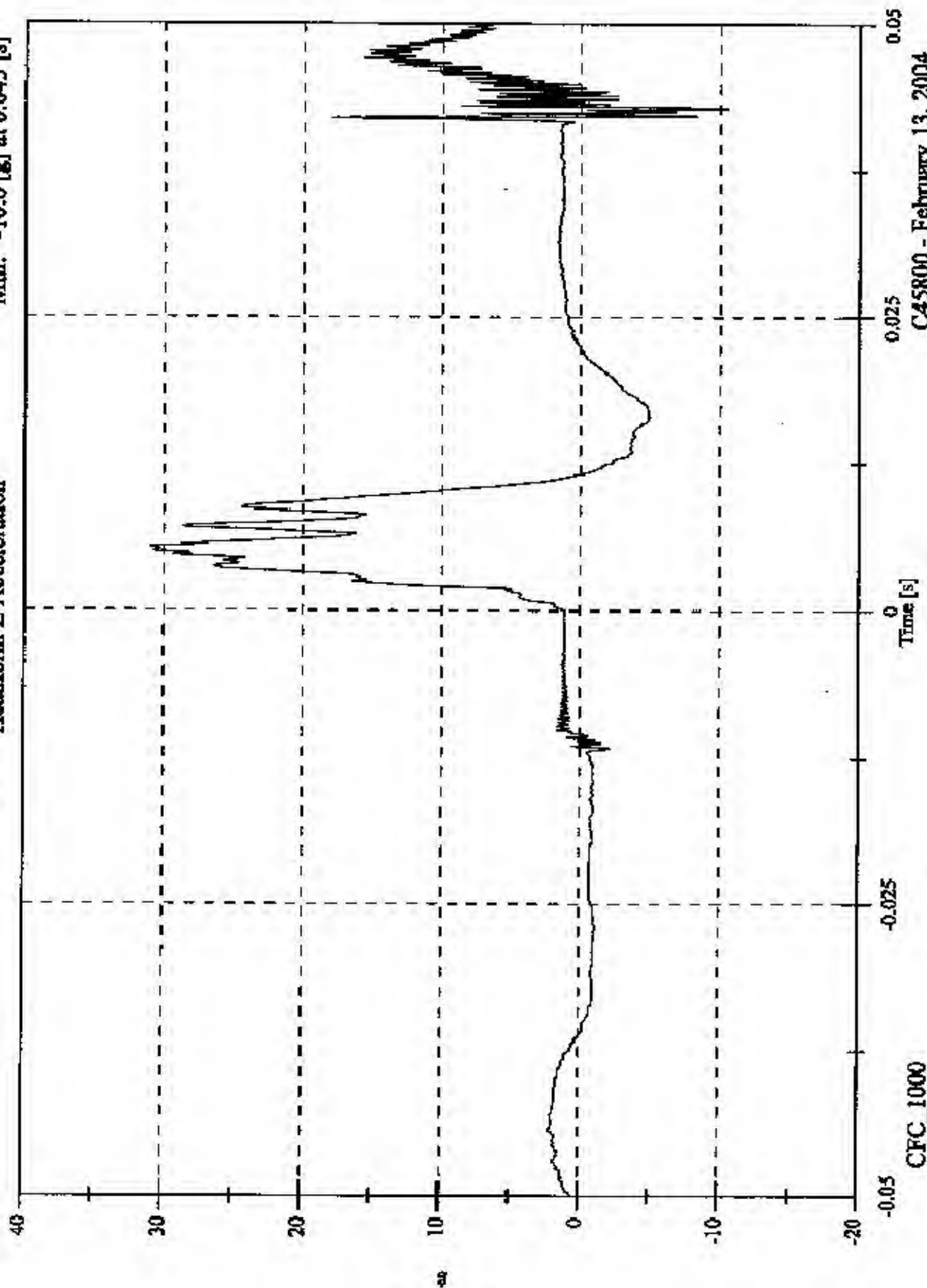


C45800 - February 13, 2004

# FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 31.0 [g] at 0.005 [s]  
Min: -10.6 [g] at 0.043 [s]



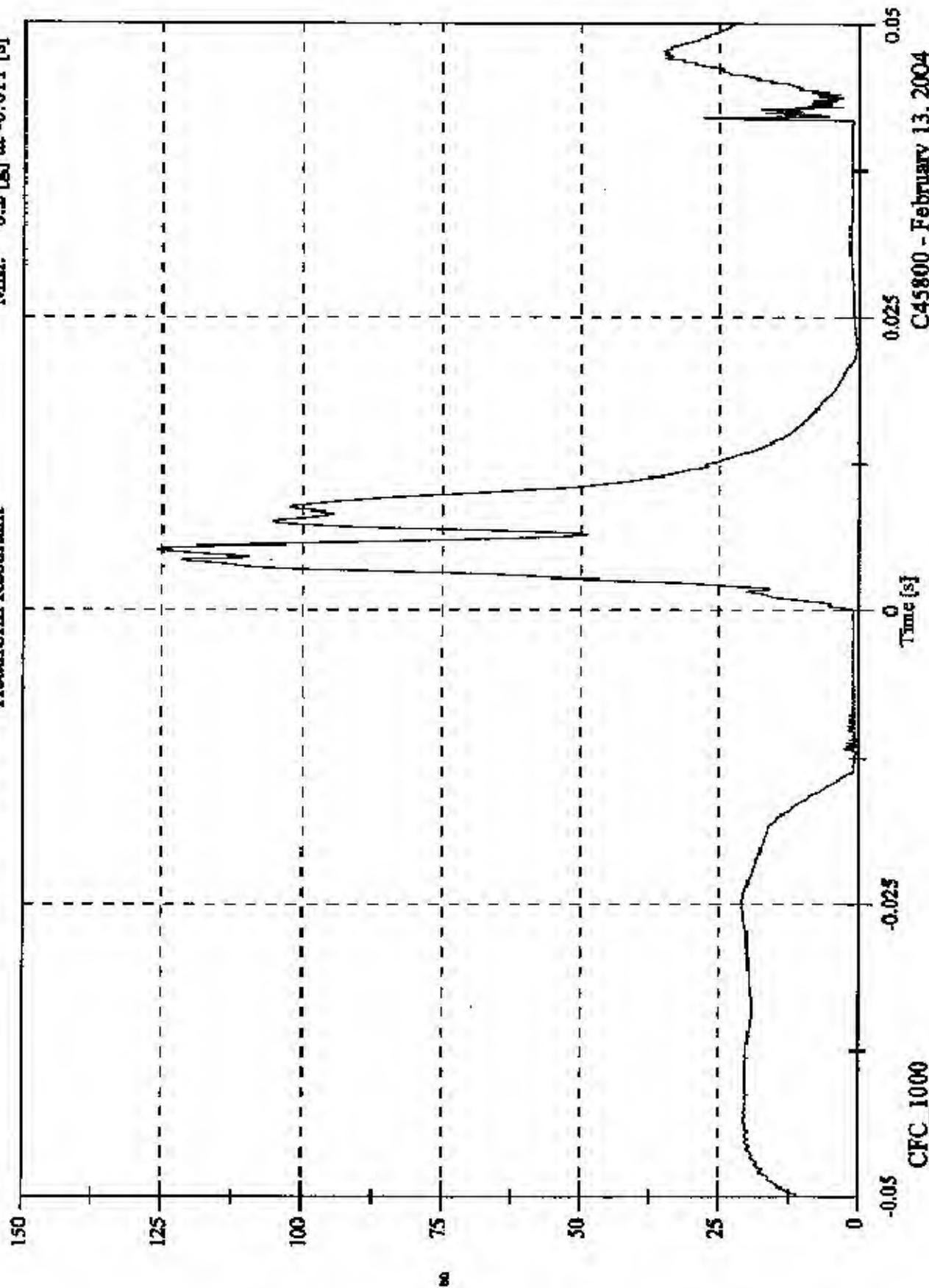
C45800 - February 13, 2004



# FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 125.9 [g] at 0.005 [s]  
Min: 0.2 [g] at -0.011 [s]

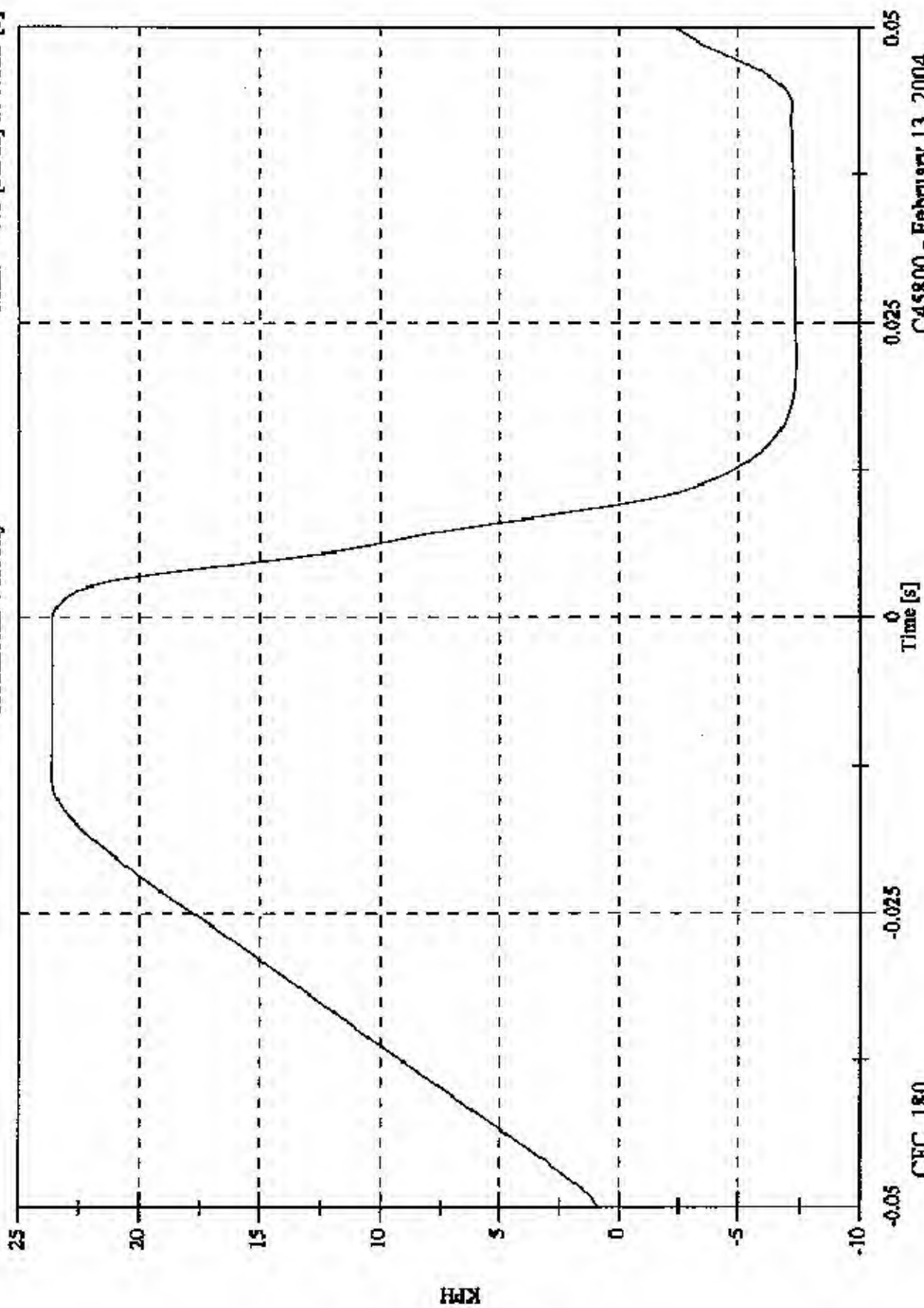


C45800 - February 13, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 23.6 [KPH] at -0.013 [s]  
Min: -7.3 [KPH] at 0.022 [s]

Headform Velocity



CFC\_180

C45800 - February 13, 2004

FMVSS 201U C45800  
Q1 VW TOLAHED OP1  
PRE TEST 13 FEB 04  
HOR 90 VER 3

FILE: 00000001

073047



FMVSS 2010 C45000  
04 VW TOLATED OPI  
POST TEST 13 FEB 04  
HCA 90 VER 3

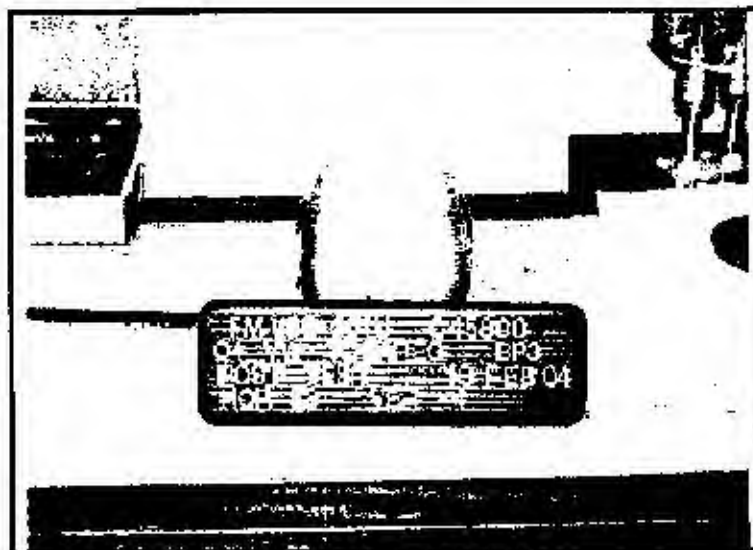
JUST IN CASE OPI

273007

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC57L64D003224
DATE OF MANUFACTURE:	05/01(SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	03
Test Date:	February 13, 2004
Target Location:	B-Pillar
Target Code:	BP3
Horizontal Impact Angle:	83°
Vertical Impact Angle:	-4°
Ambient Temperature:	22°C
Relative Humidity:	22%
Time of Impact:	11:30
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	8	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	18	<input type="checkbox"/> mm up	



POST-IMPACT BP3 HEADFORM

Free Motion HIC	700.7
HIC(d)	695.0
Impact Velocity (kph)	23.54
HIC T1 (msec)	3.2
HIC T2 (msec)	9.5

# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - BP3

FMH Headform 1255

Location: BP3

Test Date: February 13, 2004

Work File: BP3

## TEST RESULTS

Lab Temperature: 22 C

HICd: 695.0

Lab Humidity: 22 %

HIC (36ms): 700.7

Velocity at Impact: 23.54 KPH

t1: 3.2 msec

t2: 9.5 msec

Free Flight Distance: 215.68 mm

Duration: 6.3 msec

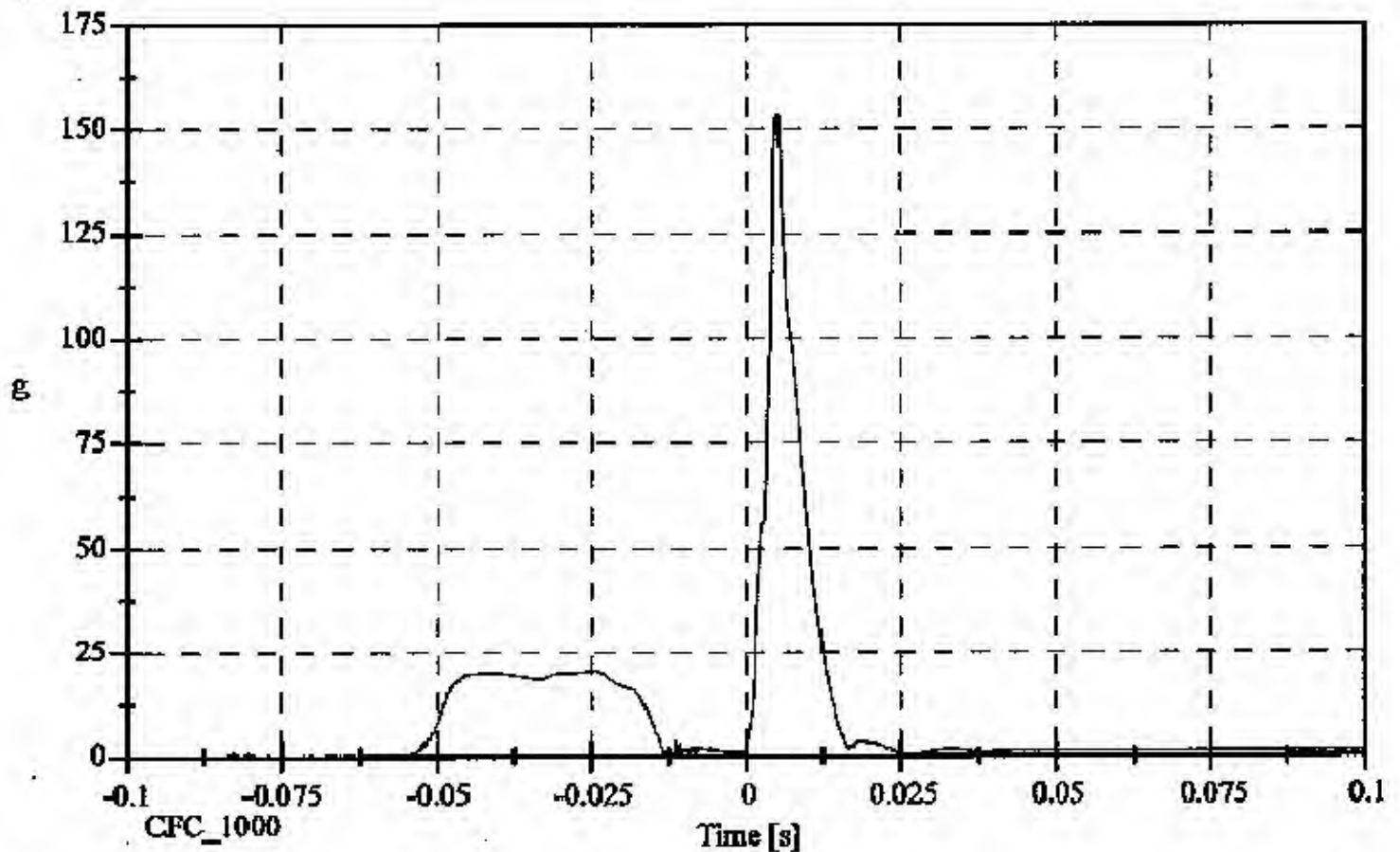
Average Acceleration: 8.6 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 153.7 [g] at 0.005 [s]

Min: 0.0 [g] at -0.096 [s]

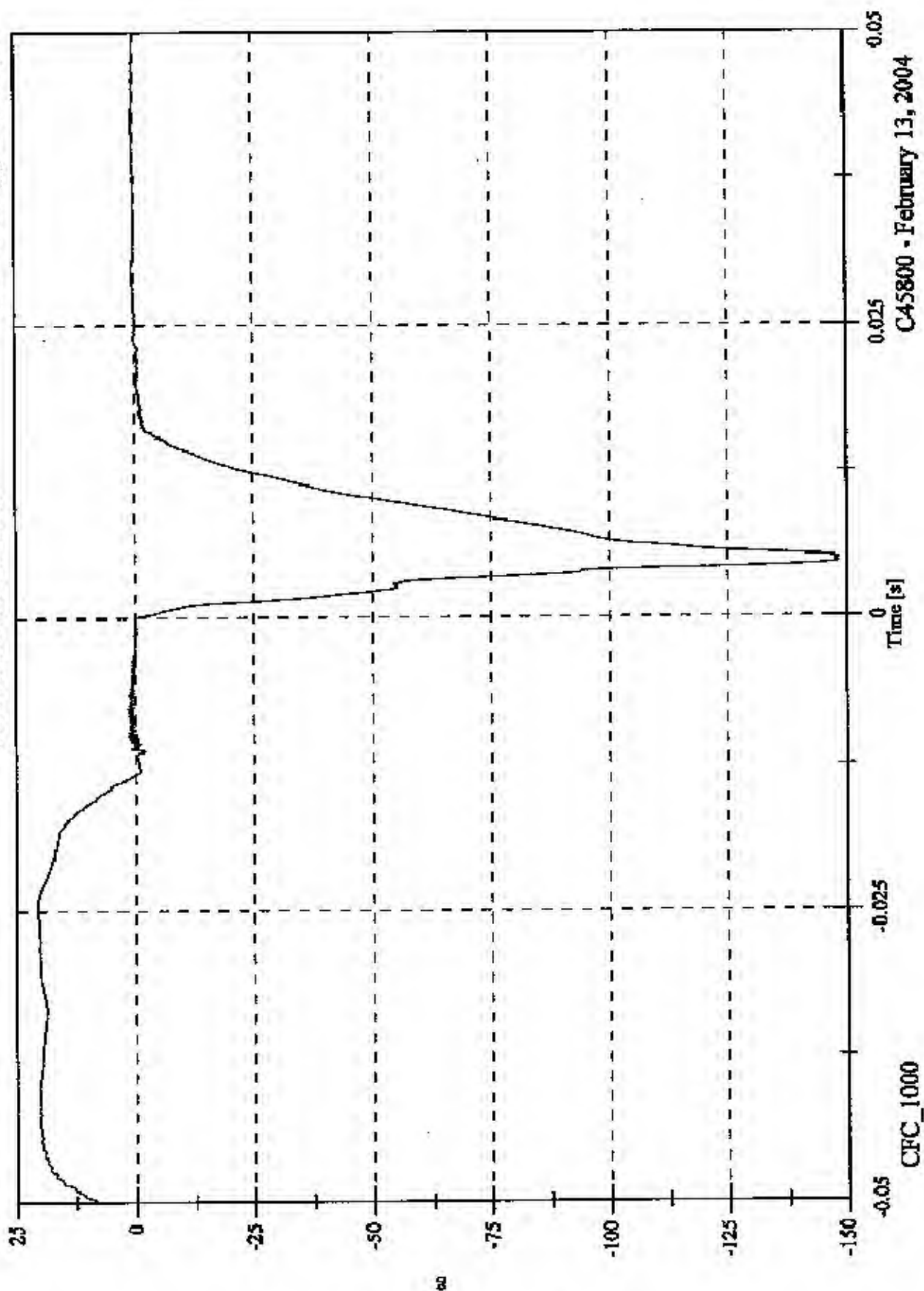




FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 20.8 [g] at -0.025 [s]  
Min: -148.7 [g] at 0.005 [s]



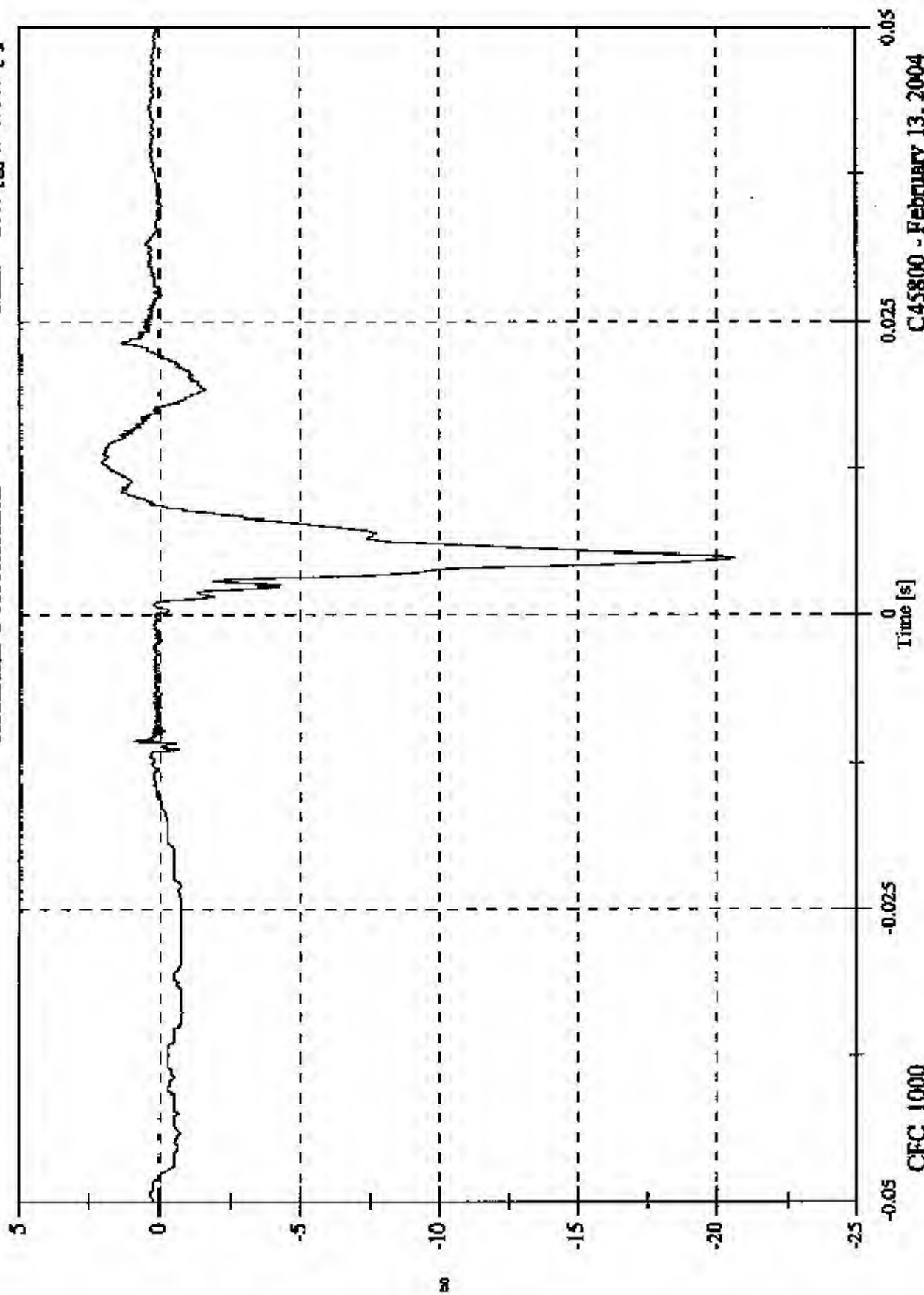
C45800 - February 13, 2004

C45800 Passenger Side BP3 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 2.1 [g] at 0.013 [s]  
Min: -20.7 [g] at 0.005 [s]



CFC\_1000

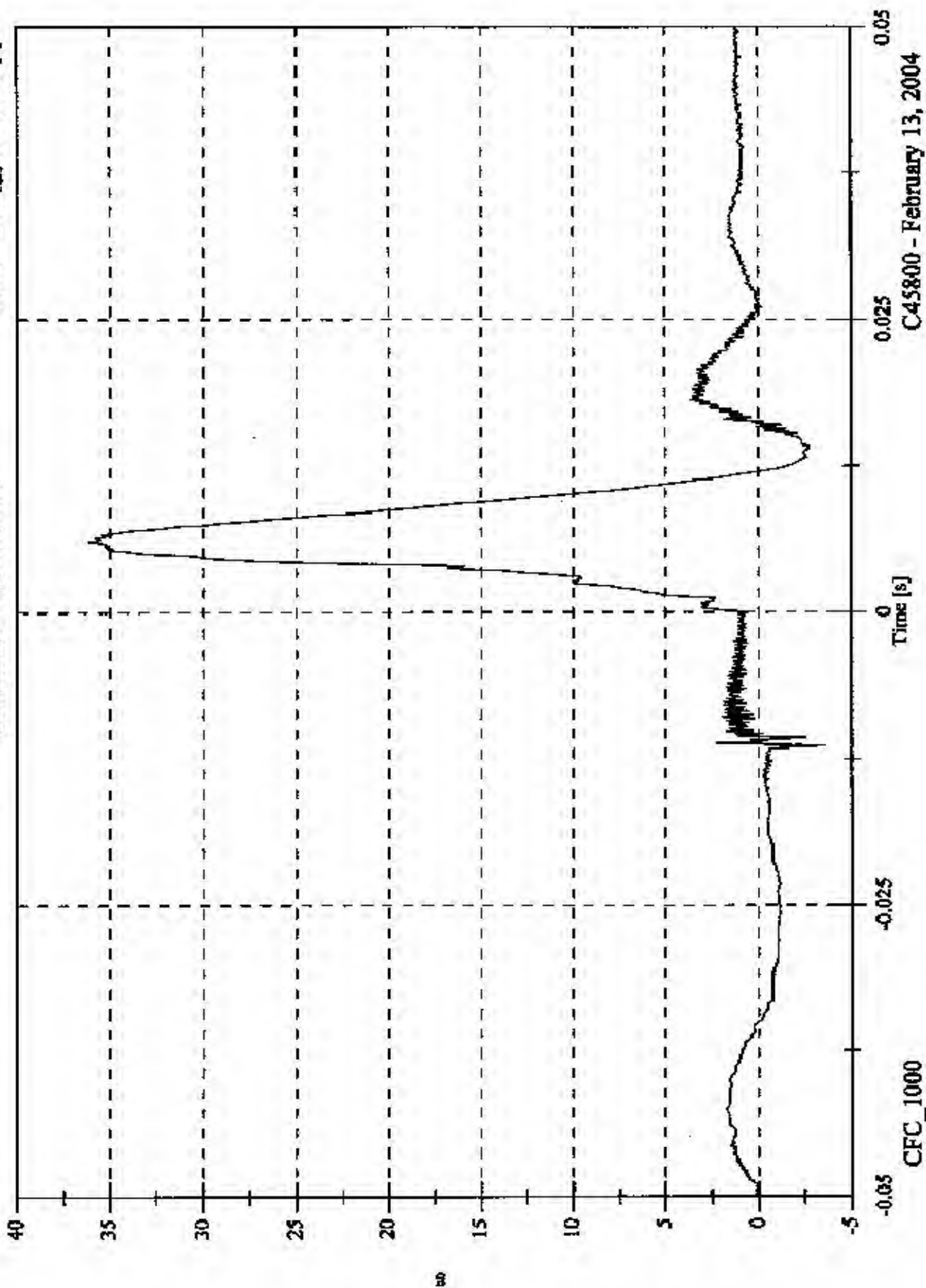
C45800 - February 13, 2004



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 36.1 [g] at 0.006 [s]  
Min: -3.5 [g] at -0.011 [s]

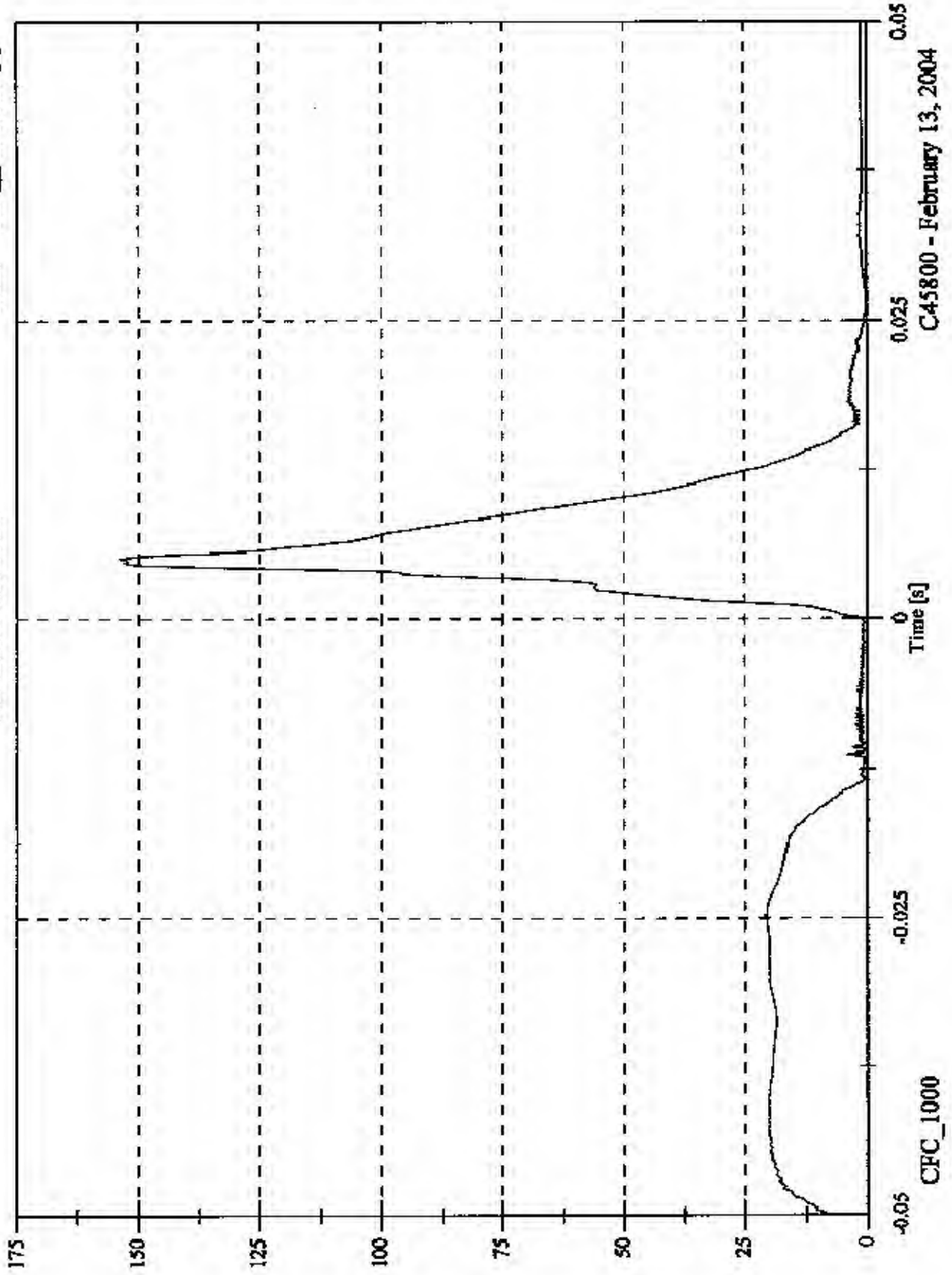


C45800 - February 13, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

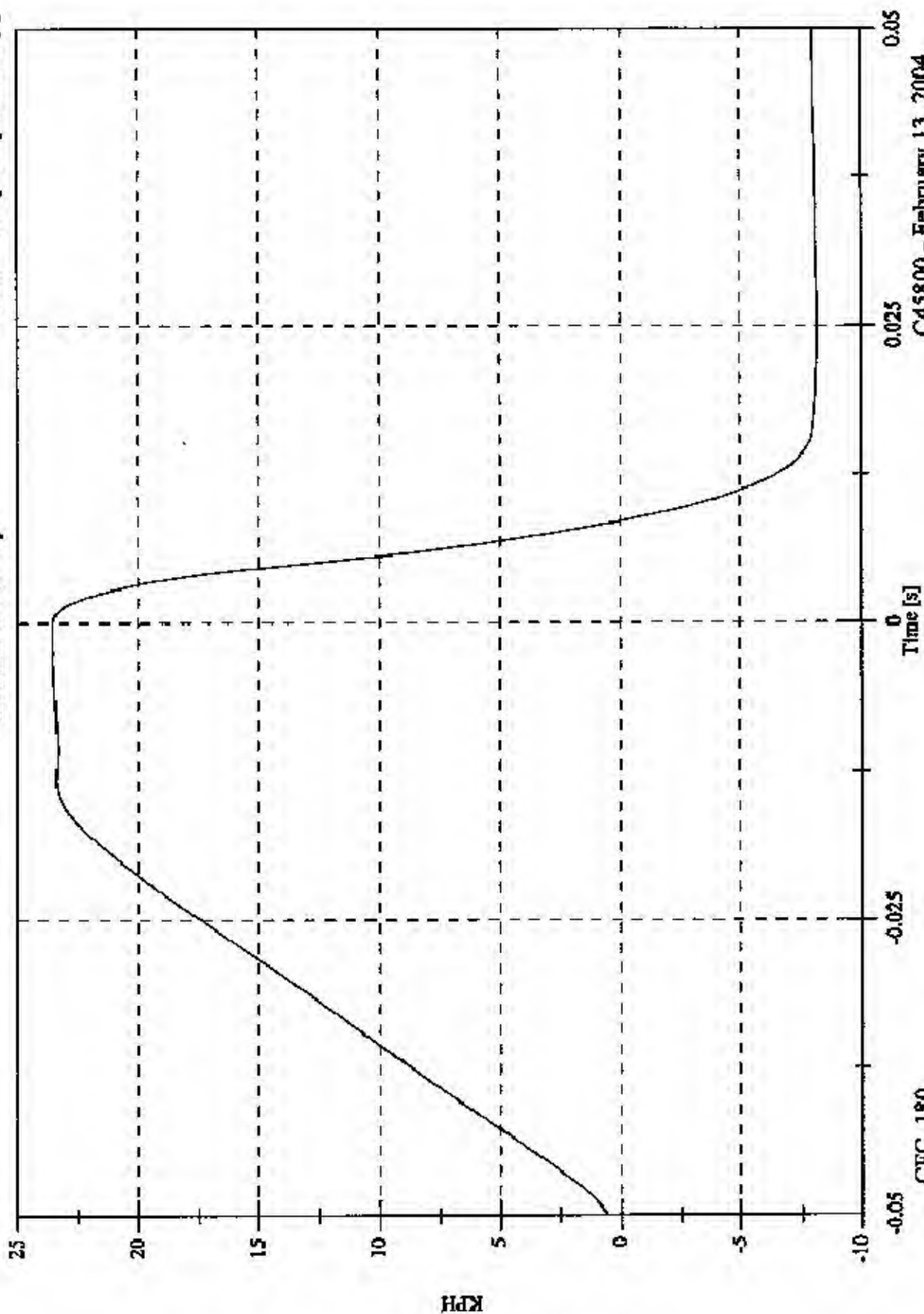
Max: 153.7 [g] at 0.005 [s]  
Min: 0.2 [g] at 0.027 [s]



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 23.5 [KPH] at -0.000 [s]  
Min: -8.2 [KPH] at 0.026 [s]

Headform Velocity



CFC\_180

Time [s]

C45800 - February 13, 2004





PRE IMPACT BPG



PMVSS 201U C45800  
04 VW TOUAREG BP3  
POST TEST  
HOR 83 VER 13 FEB 04  
-4

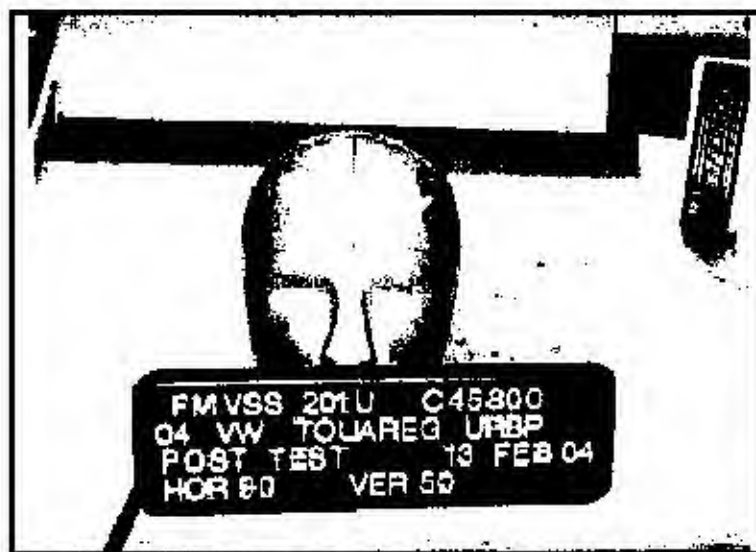
POST-IMPACT 04

2730-07

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	05/03(SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	04
Test Date:	February 13, 2004
Target Location:	Upper Roof
Target Code:	URBP
Horizontal Impact Angle:	90°
Vertical Impact Angle:	50°
Ambient Temperature:	22°C
Relative Humidity:	22%
Time of Impact:	12:00
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	<input type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	47	mm up	



POST-IMPACT URBP HEADFORM

Free Motion HIC	1014.2
HIC(d)	931.6
Impact Velocity (kph)	23.47
HIC T1 (msec)	3.1
HIC T2 (msec)	9.4



# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - URBP

FMH Headform 0062

Location: URBP

Test Date: February 13, 2004

Work File: URBP

## TEST RESULTS

Lab Temperature: 22 C

HICd: 931.6

Lab Humidity: 22 %

HIC (36ms): 1014.2

Velocity at Impact: 23.47 KPH

t1: 3.1 msec

t2: 9.4 msec

Free Flight Distance: 222.84 mm

Duration: 6.3 msec

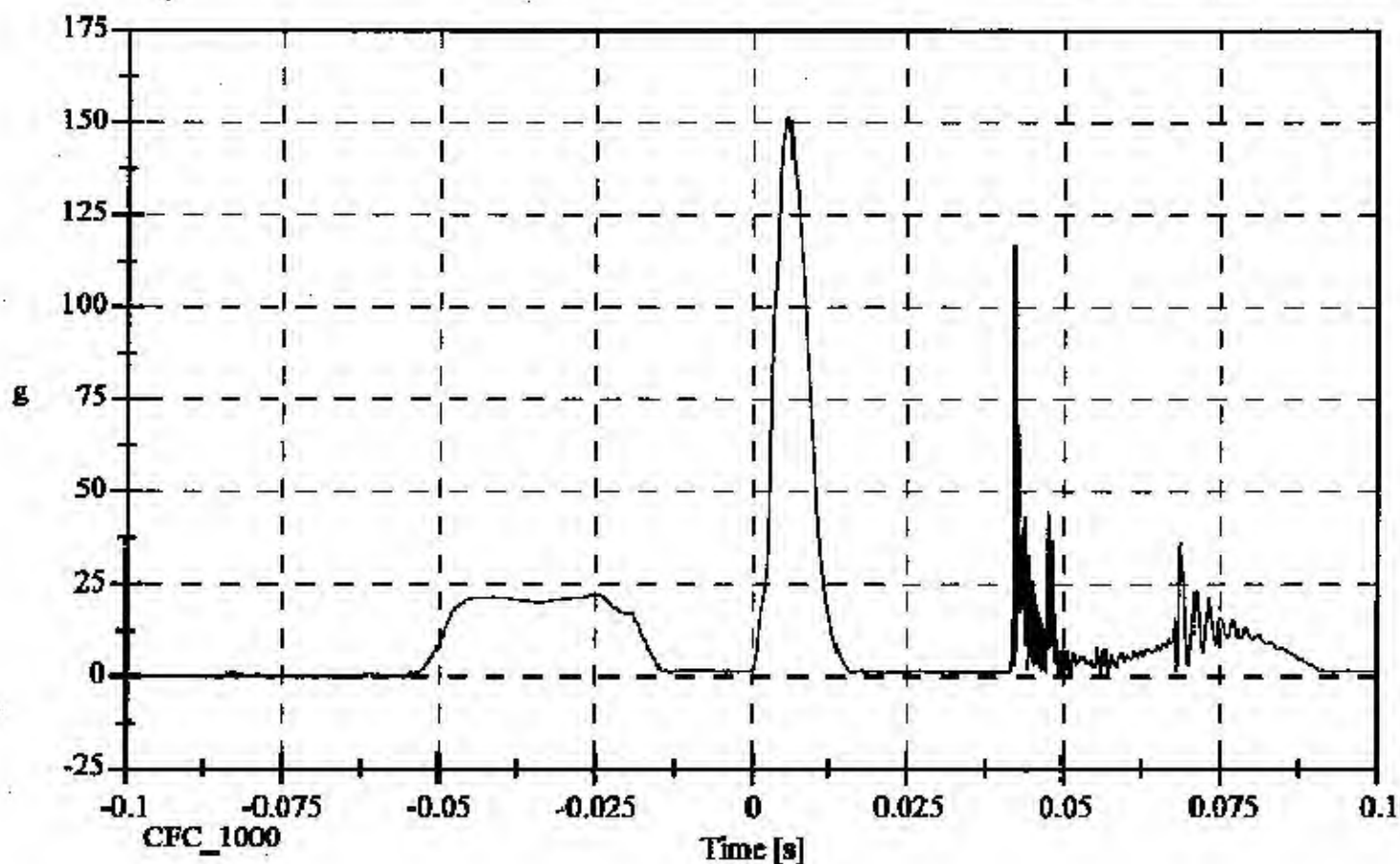
Average Acceleration: 11.2 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 151.6 [g] at 0.006 [s]

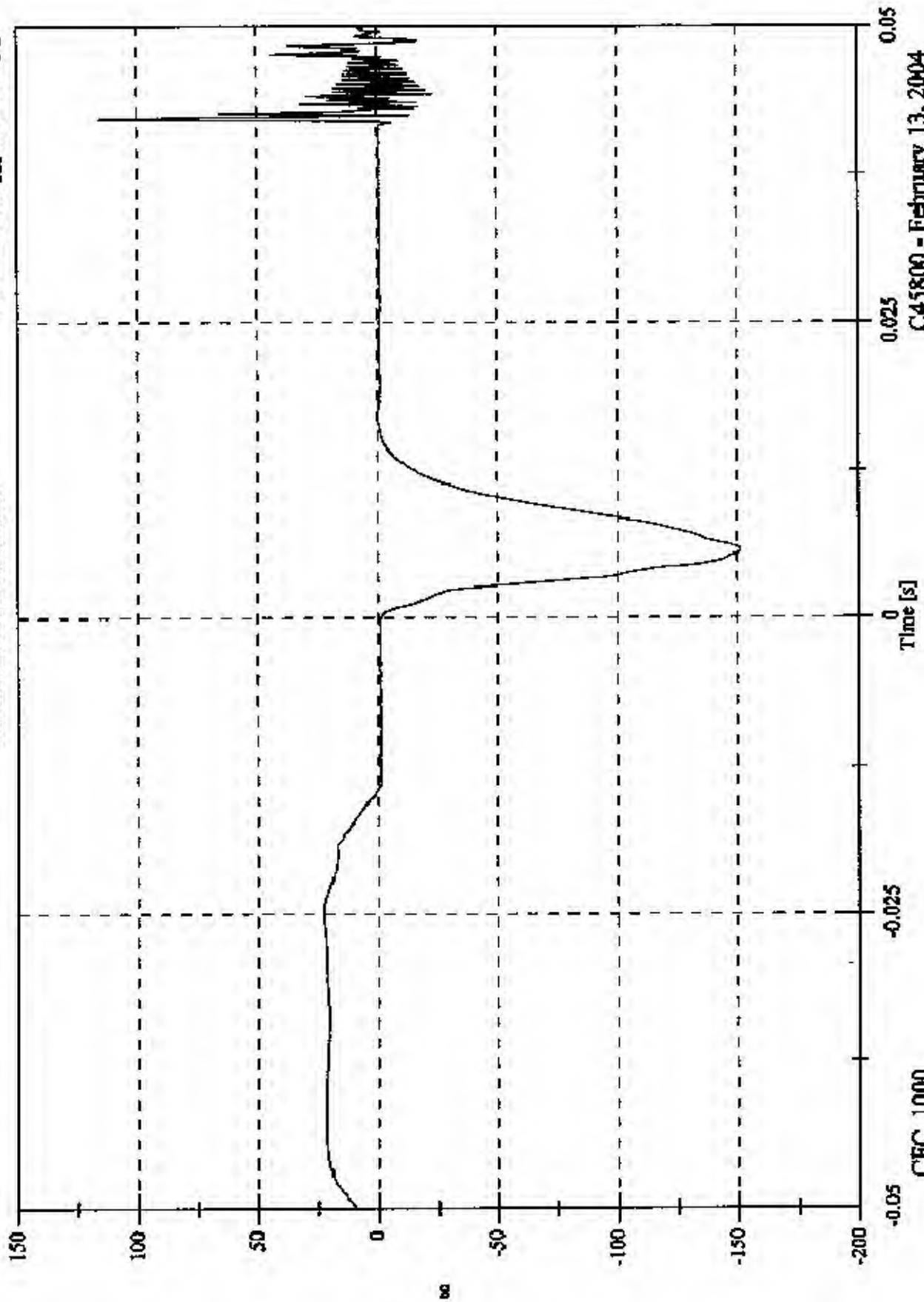
Min: -0.0 [g] at -0.099 [s]



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 115.8 [g] at 0.042 [s]  
Min: -151.3 [g] at 0.006 [s]



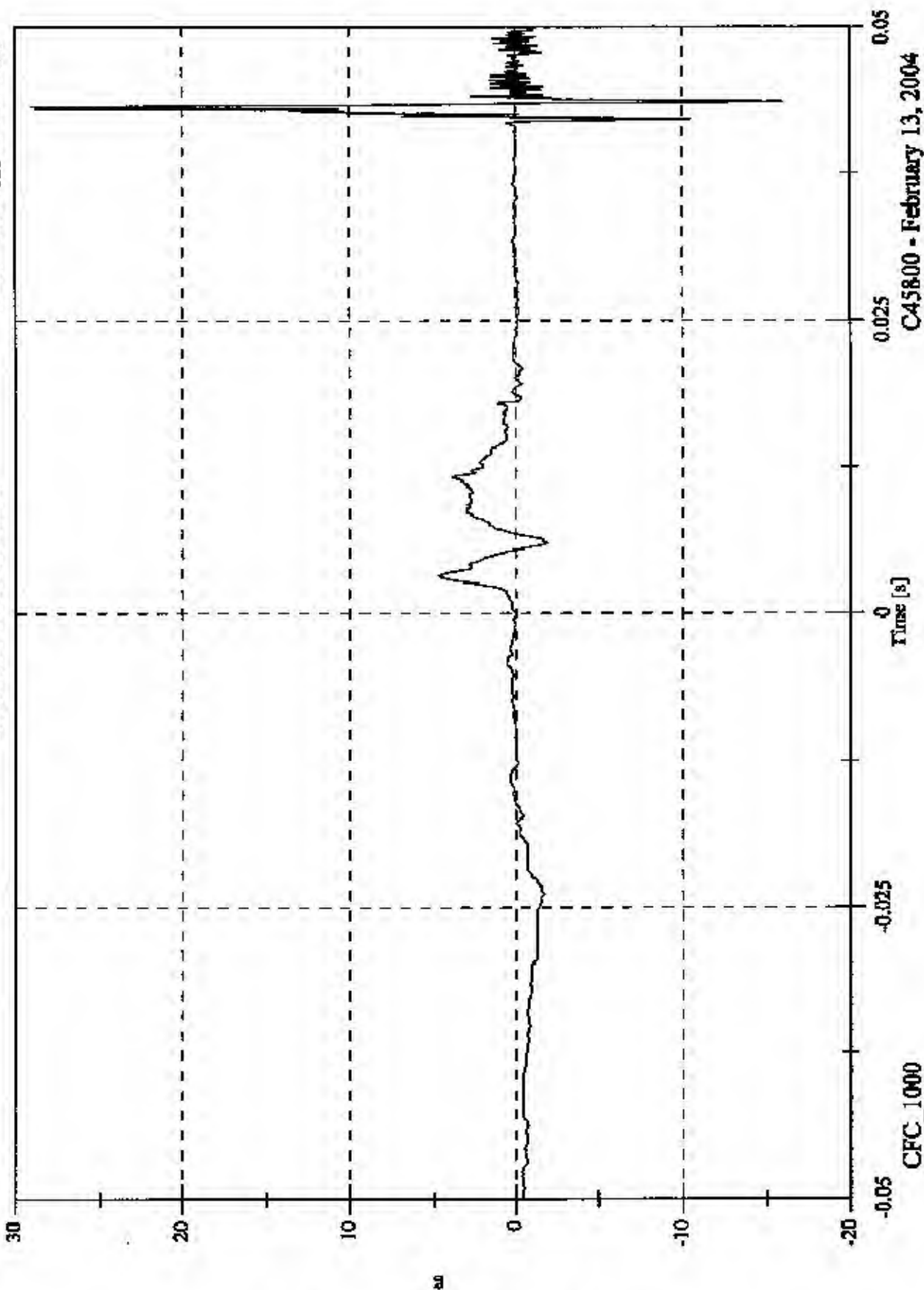
C45800 Passenger Side URBP Impact Plot #1



# FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 29.1 [g] at 0.043 [s]  
Min: -15.9 [g] at 0.044 [s]



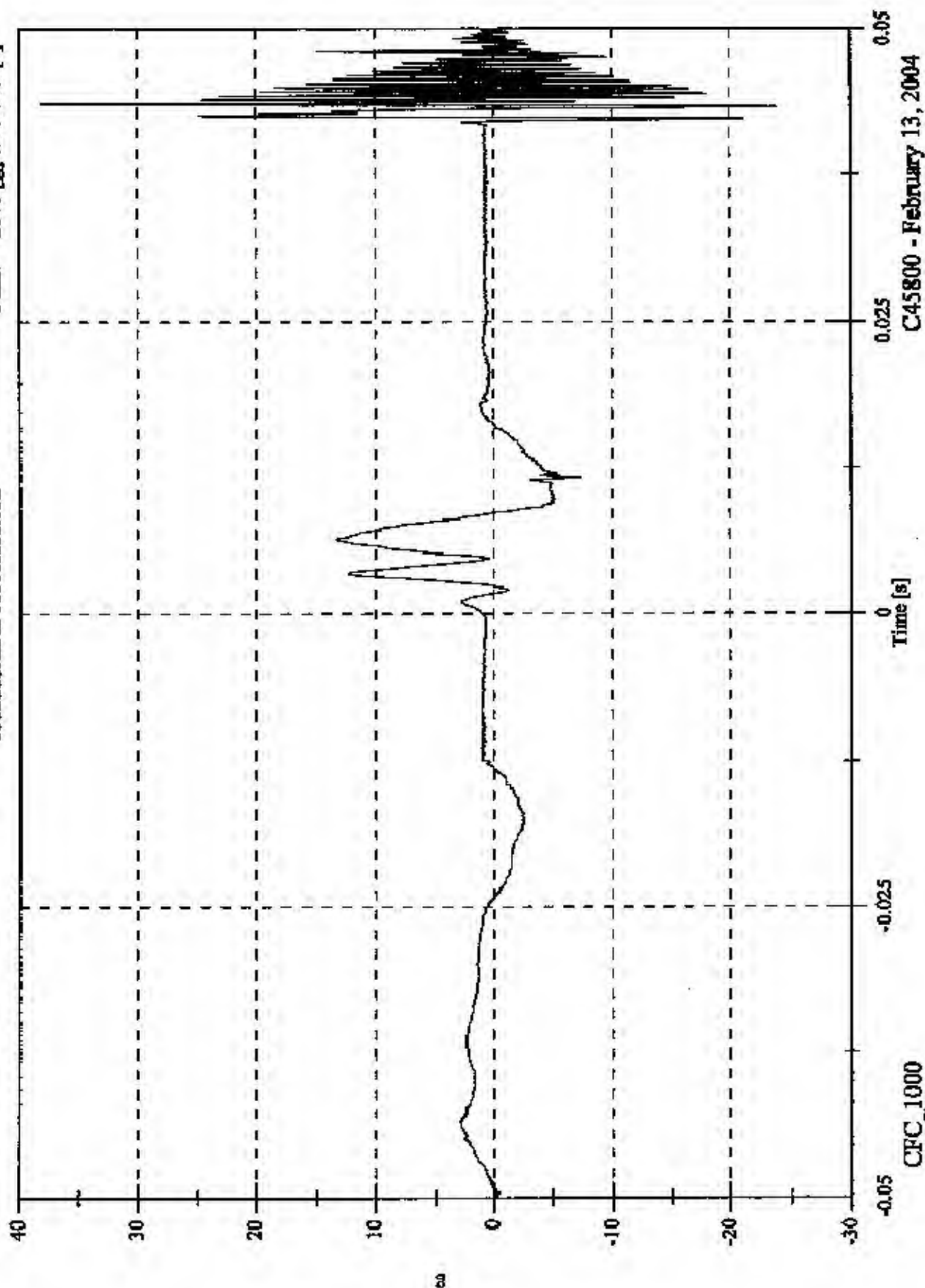
C45800 Passenger Side URBP Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 38.1 [g] at 0.044 [s]

Min: -23.8 [g] at 0.043 [s]

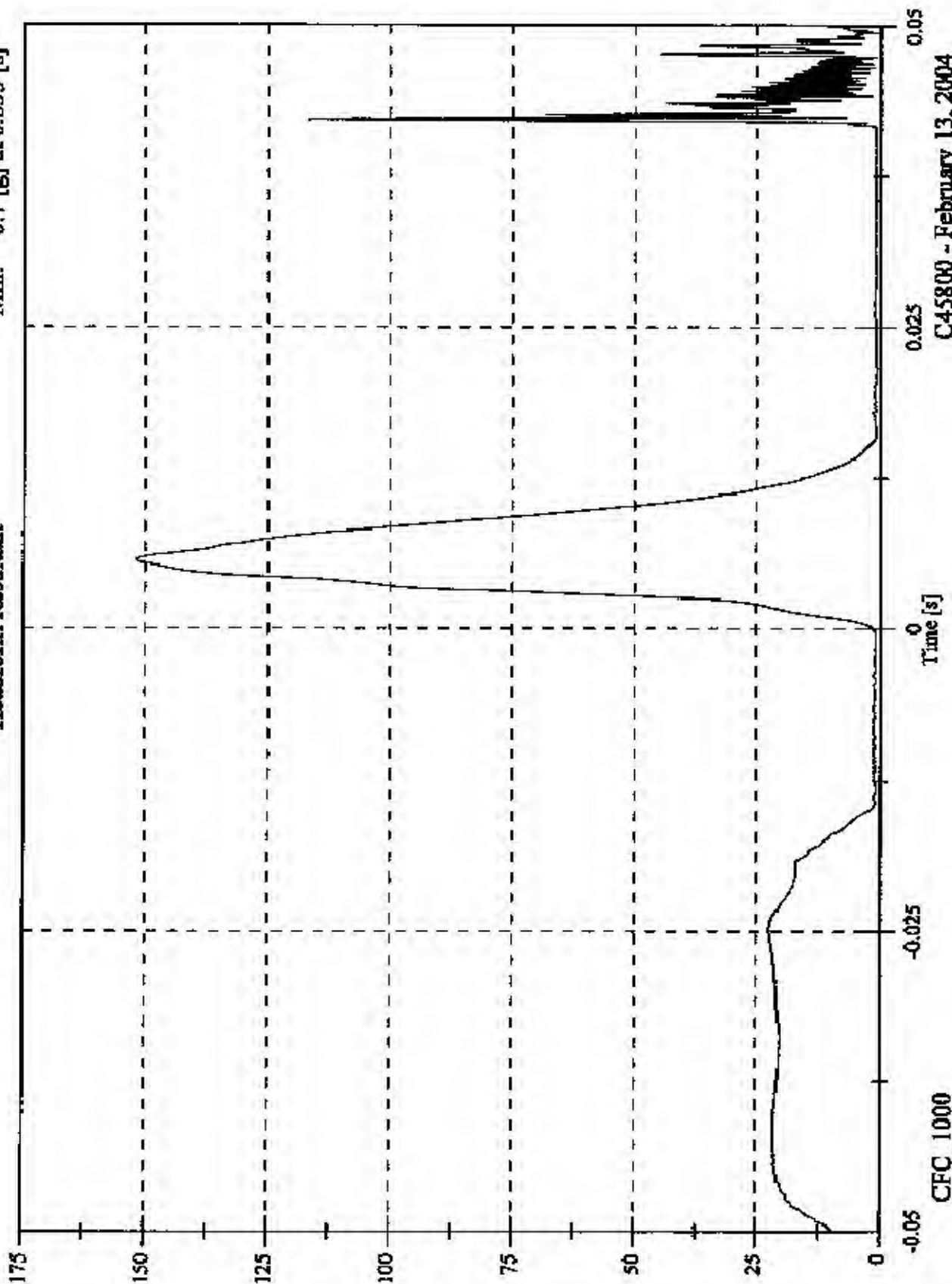


C45800 Passenger Side URBP Impact Plot #3

# FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 151.6 [g] at 0.006 [s]  
Min: 0.7 [g] at 0.035 [s]

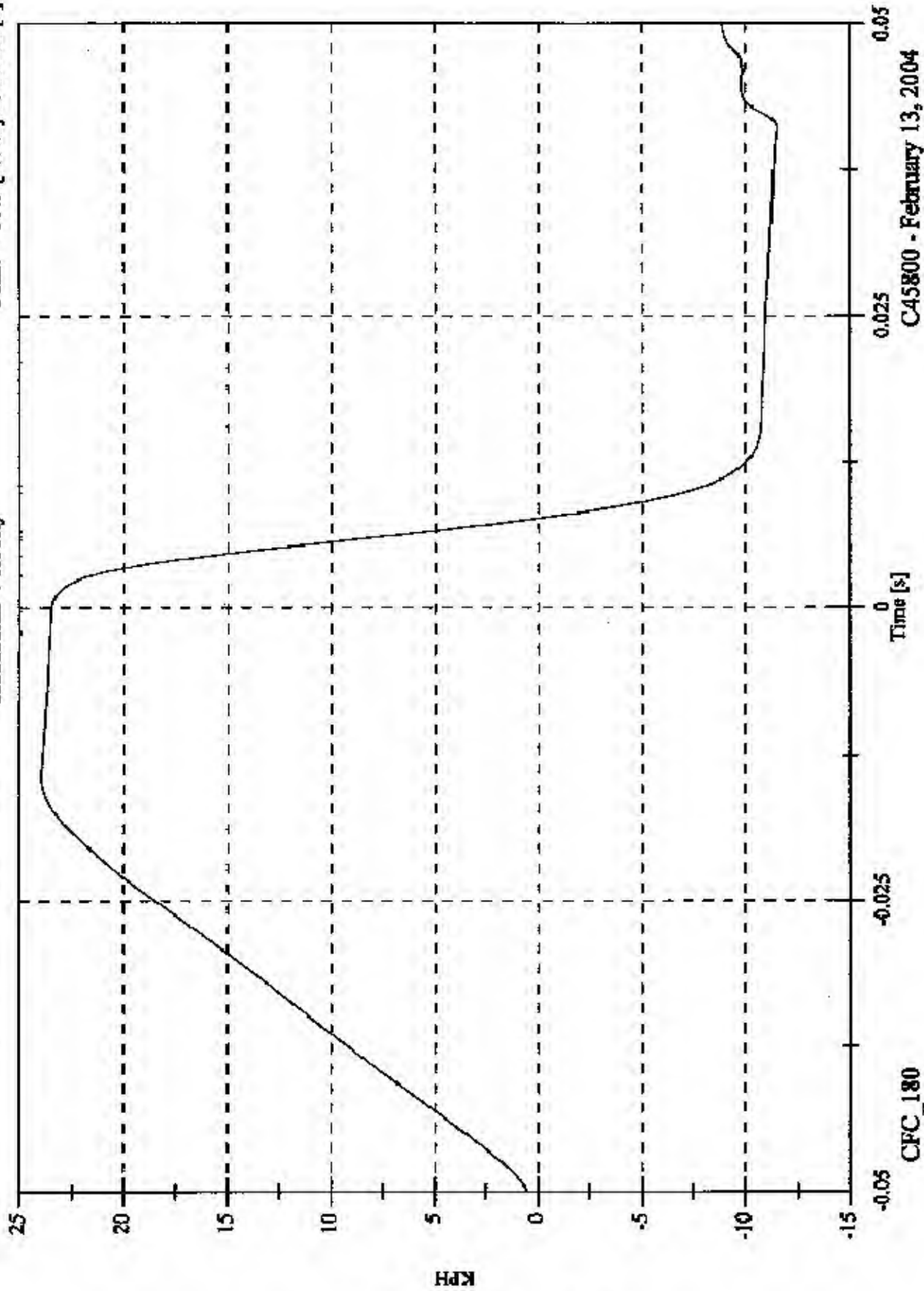


C45800 Passenger Side URBP Impact Plot #4

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 24.0 [KPH] at -0.014 [s]  
Min: -11.5 [KPH] at 0.041 [s]

Headform Velocity



CFC\_180

-0.025

Time [s]

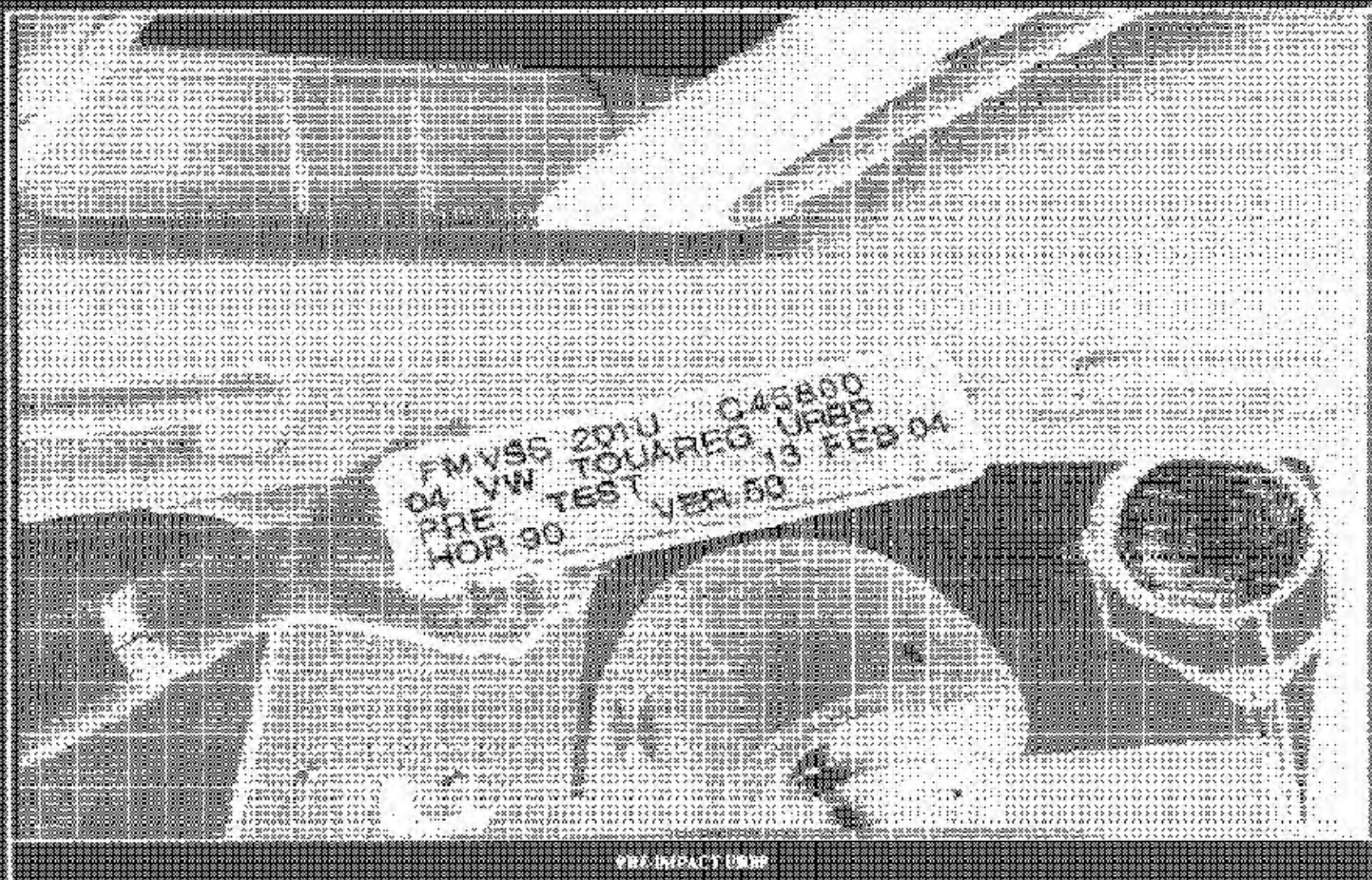
0.025

0.05

C45800 - February 13, 2004

C45800 Passenger Side URBP Impact Plot #5





WPA IMPACT UNIT



FMVSS 2010 C45800  
04 VW TQWAREG URBP  
POST TEST 13 FEB 04  
HOR 90 VER 50

POST-IMPACT LIB

5770-01



VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	03/03(SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	05
Test Date:	February 13, 2004
Target Location:	A-Pillar
Target Code:	AP1
Horizontal Impact Angle:	127°
Vertical Impact Angle:	48°
Ambient Temperature:	22°C
Relative Humidity:	22%
Time of Impact:	15:00
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	14	x	mm right <input type="checkbox"/> mm left
On Centerline	14		mm up



POST-IMPACT AP1 HEADFORM

Free Motion HIC	788.7
HIC(d)	761.5
Impact Velocity (kph)	18.48
HIC T1 (msec)	5.0
HIC T2 (msec)	9.0

# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - AP1

FMH Headform 080.5

Location: AP1

Test Date: February 13, 2004

Work File: AP1

## TEST RESULTS

Lab Temperature: 22 C

HICd: 761.5

Lab Humidity: 22 %

HIC (36ms): 788.7

Velocity at Impact: 18.48 KPH

t1: 5.0 msec

t2: 9.0 msec

Free Flight Distance: 223.18 mm

Duration: 4.1 msec

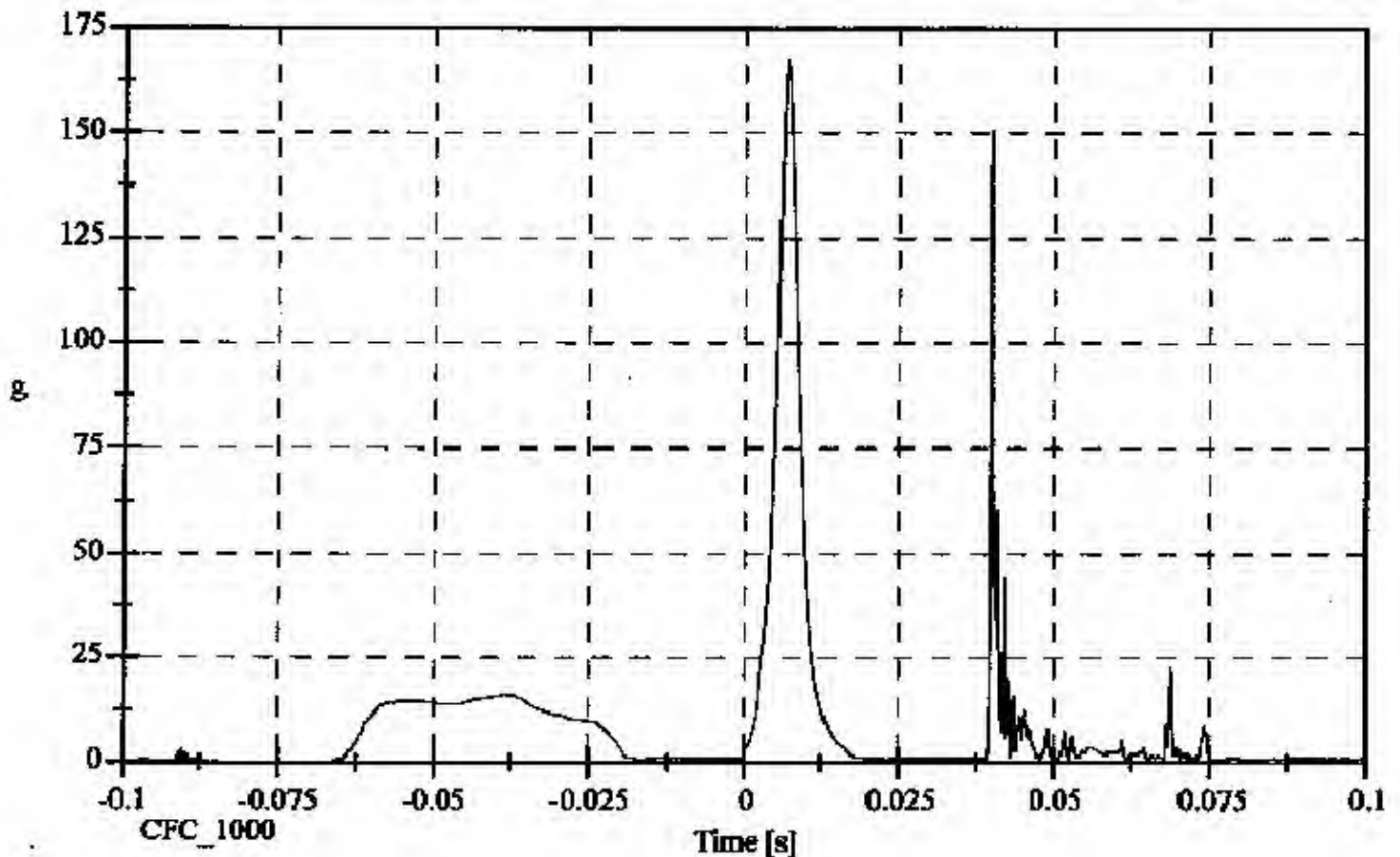
Average Acceleration: 8.3 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 167.7 [g] at 0.007 [s]

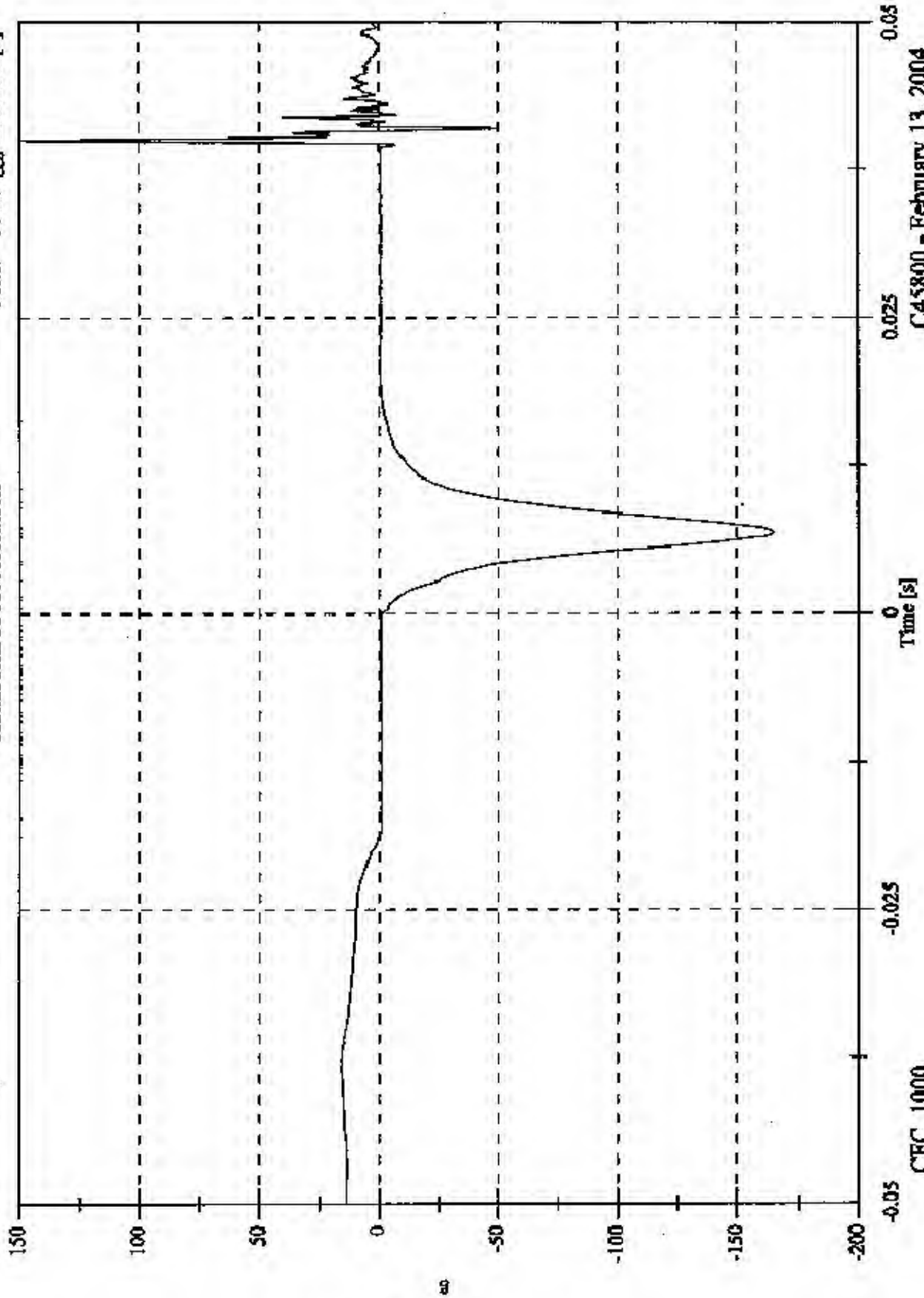
Min: 0.0 [g] at -0.077 [s]



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 149.5 [g] at 0.040 [s]  
Min: -164.9 [g] at 0.007 [s]

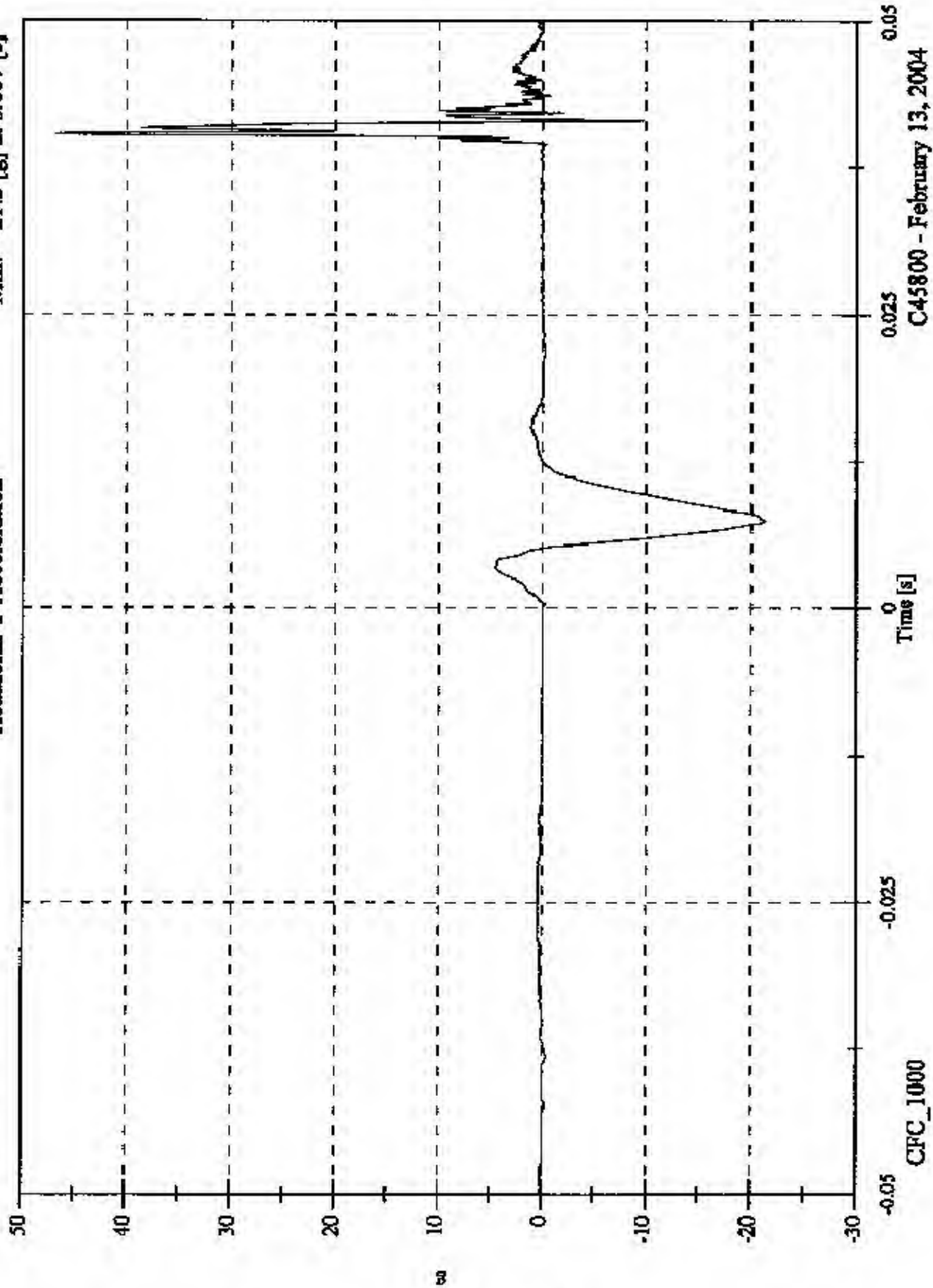


C45800 - February 13, 2004

# FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 47.0 [g] at 0.040 [s]  
Min: -21.3 [g] at 0.007 [s]

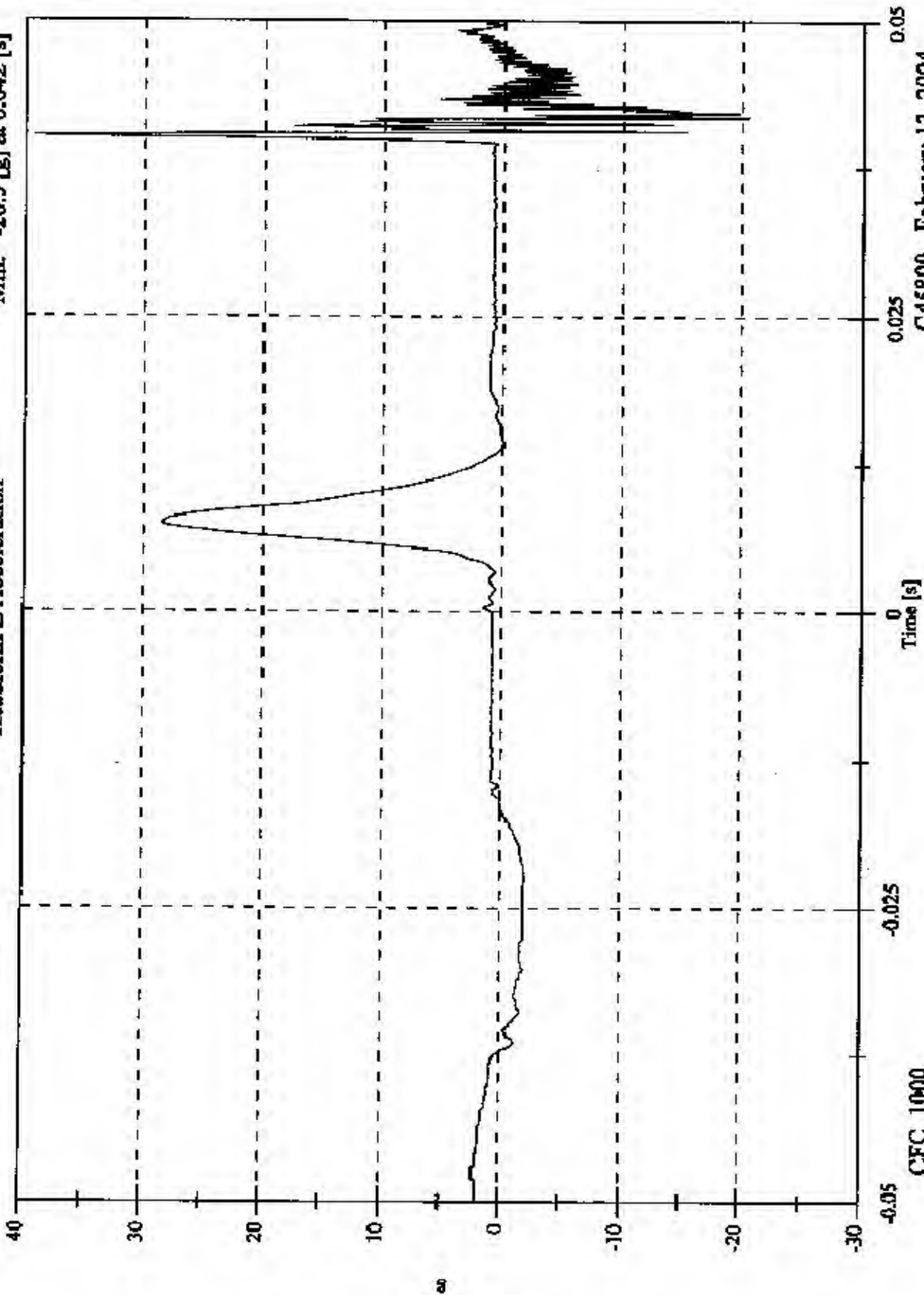


C45800 Passenger Side AP1 Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 39.3 [g] at 0.040 [s]  
Min: -20.5 [g] at 0.042 [s]

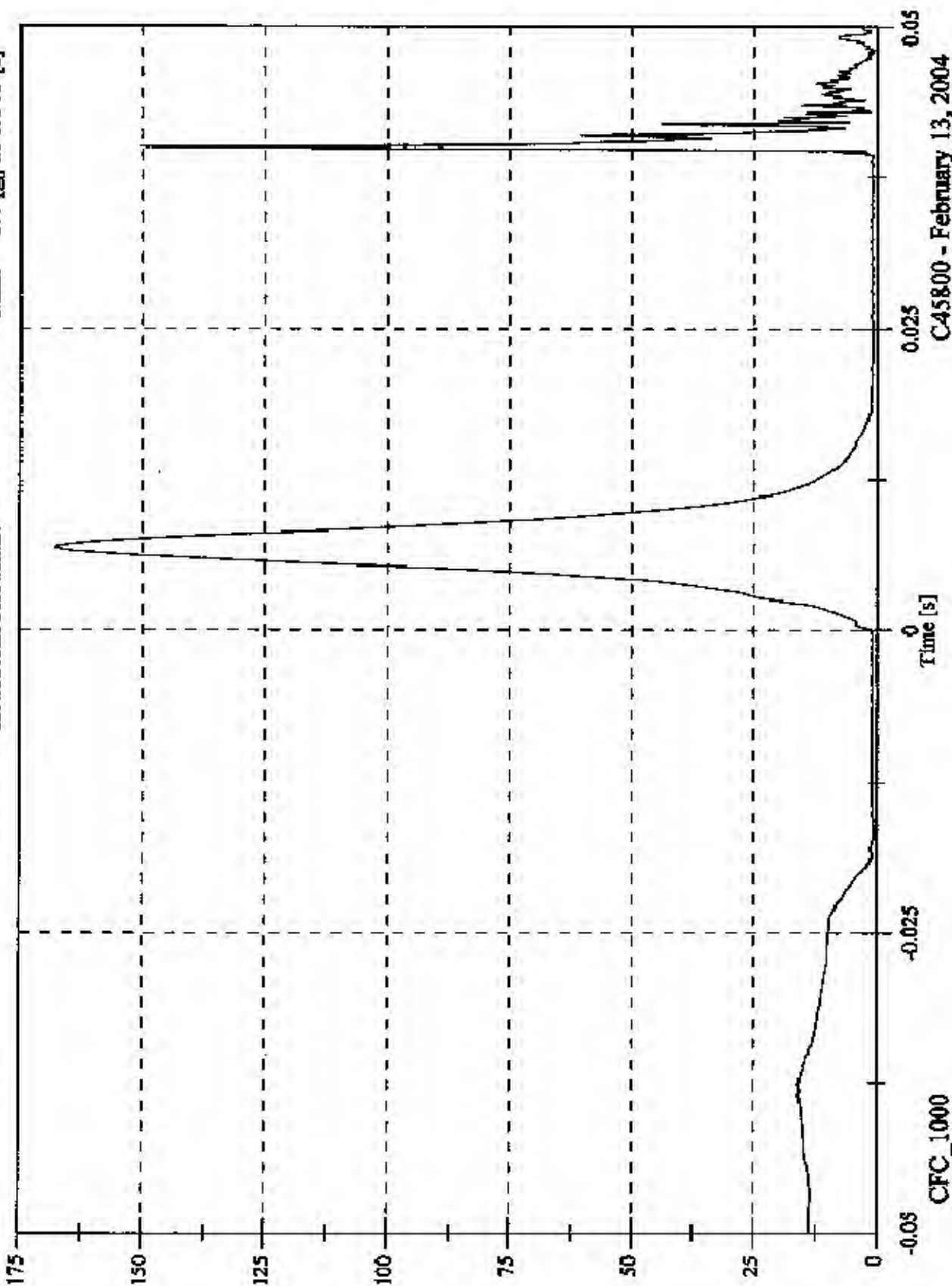




# FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

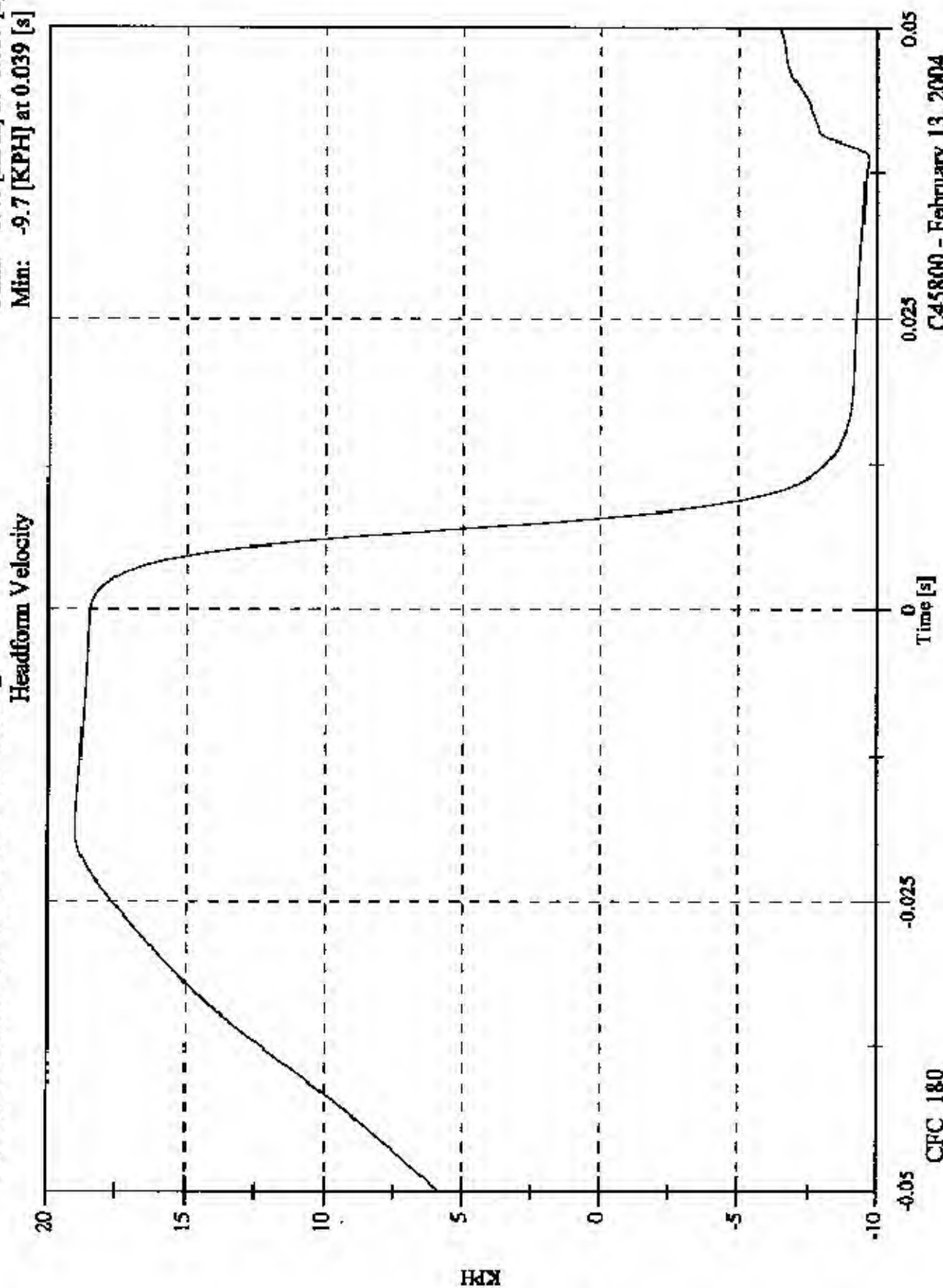
Max: 167.7 [g] at 0.007 [s]  
Min: 0.7 [g] at 0.048 [s]

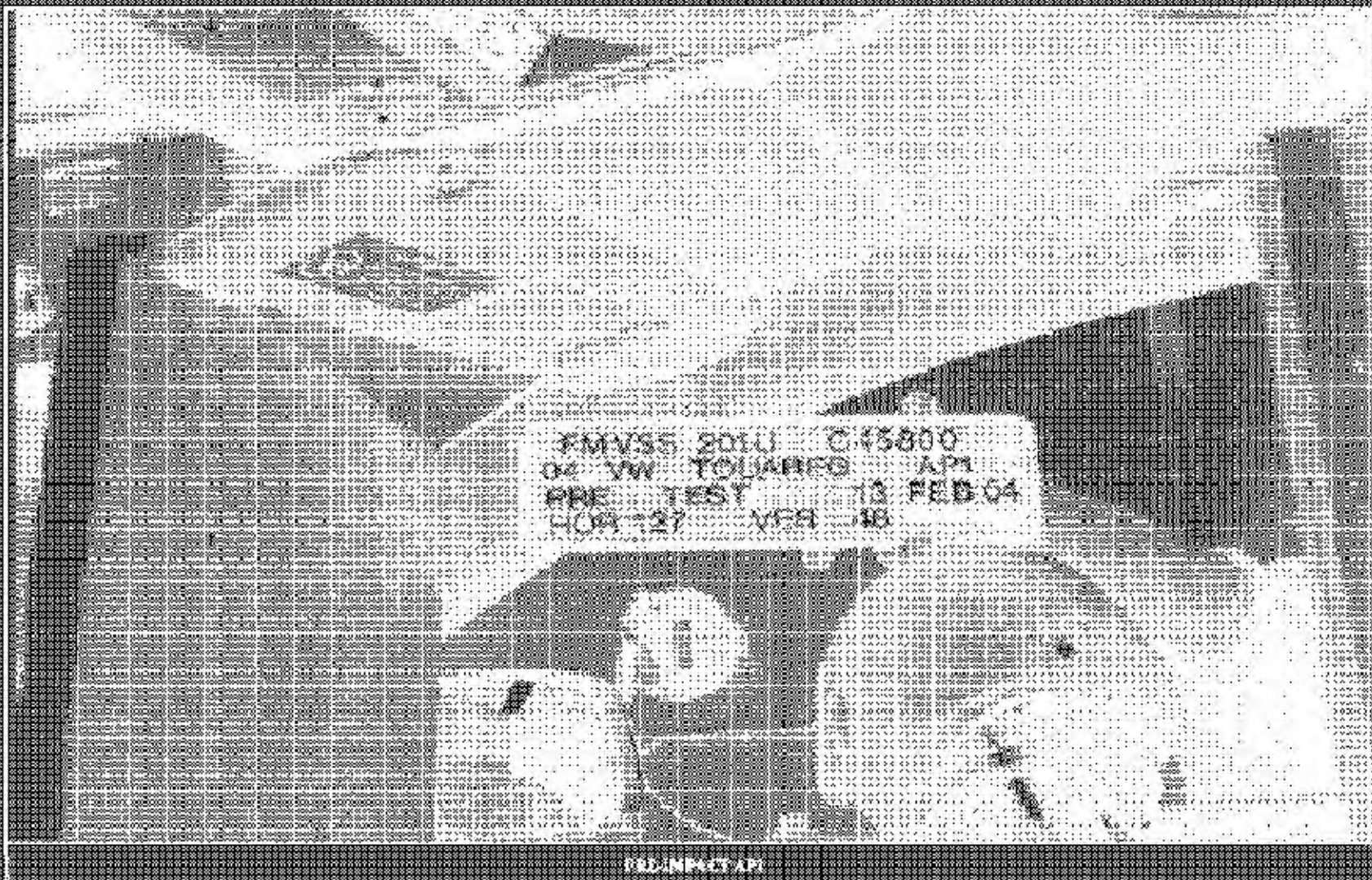


C45800 - February 13, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 19.0 [KPH] at -0.019 [s]  
Min: -9.7 [KPH] at 0.039 [s]

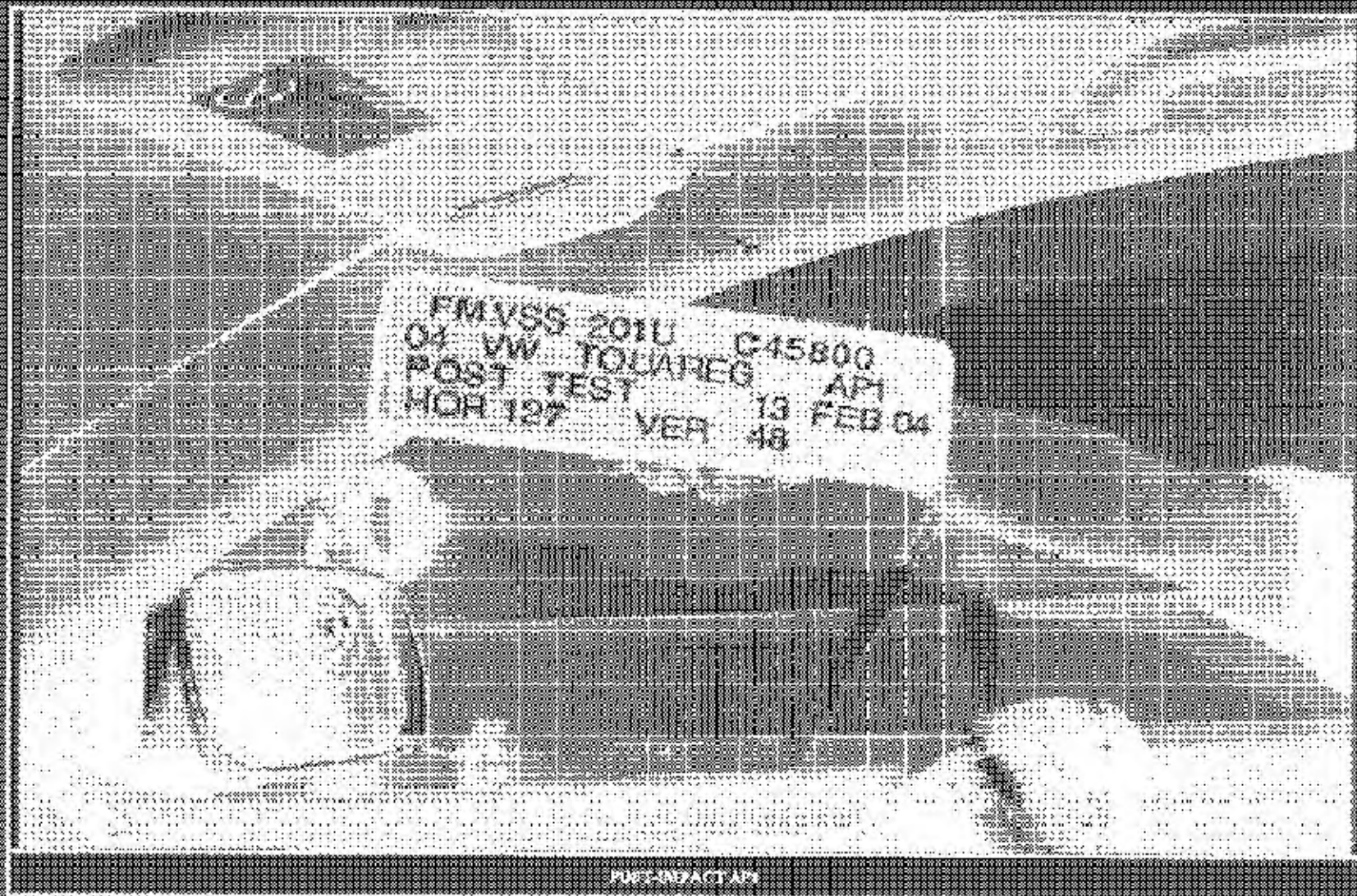




RED INNET API

8770-07



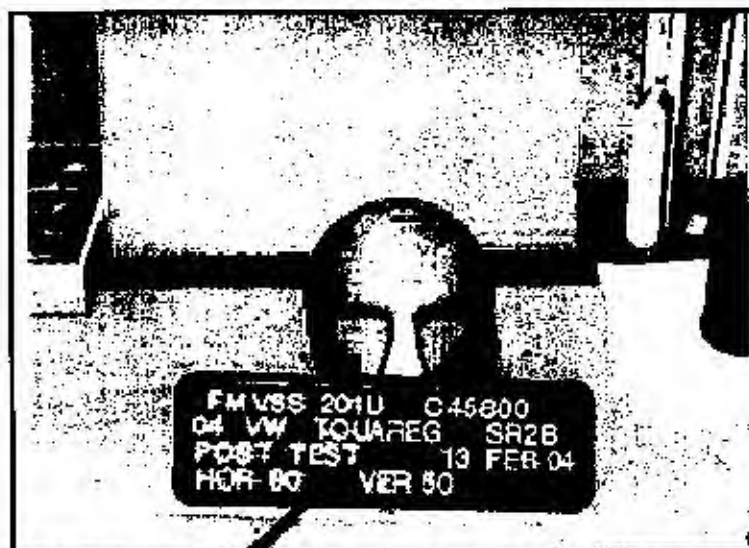


POST-IMPACT AIR

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	05/03 (SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	06
Test Date:	February 13, 2004
Target Location:	Side Rail
Target Code:	SR2B
Horizontal Impact Angle:	90°
Vertical Impact Angle:	48°
Ambient Temperature:	22°C
Relative Humidity:	22%
Time of Impact:	15:35
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	mm right	mm left
On Centerline	30	mm up	



POST-IMPACT SR2B HEADFORM (Placard mislabeled VER. 50 should be VER. 48)

Free Motion HIC	352.5
HIC(d)	432.4
Impact Velocity (kph)	18.35
HIC T1 (msec)	4.2
HIC T2 (msec)	11.4



# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - SR2B

FMH Headform 0355

Location: SR2B

Test Date: February 13, 2004

Work File: SR2B

## TEST RESULTS

Lab Temperature: 22 C

HICd: 432.4

Lab Humidity: 22 %

HIC (36ms): 352.5

Velocity at Impact: 18.35 KPH

t1: 4.2 msec

t2: 11.4 msec

Free Flight Distance: 219.24 mm

Duration: 7.2 msec

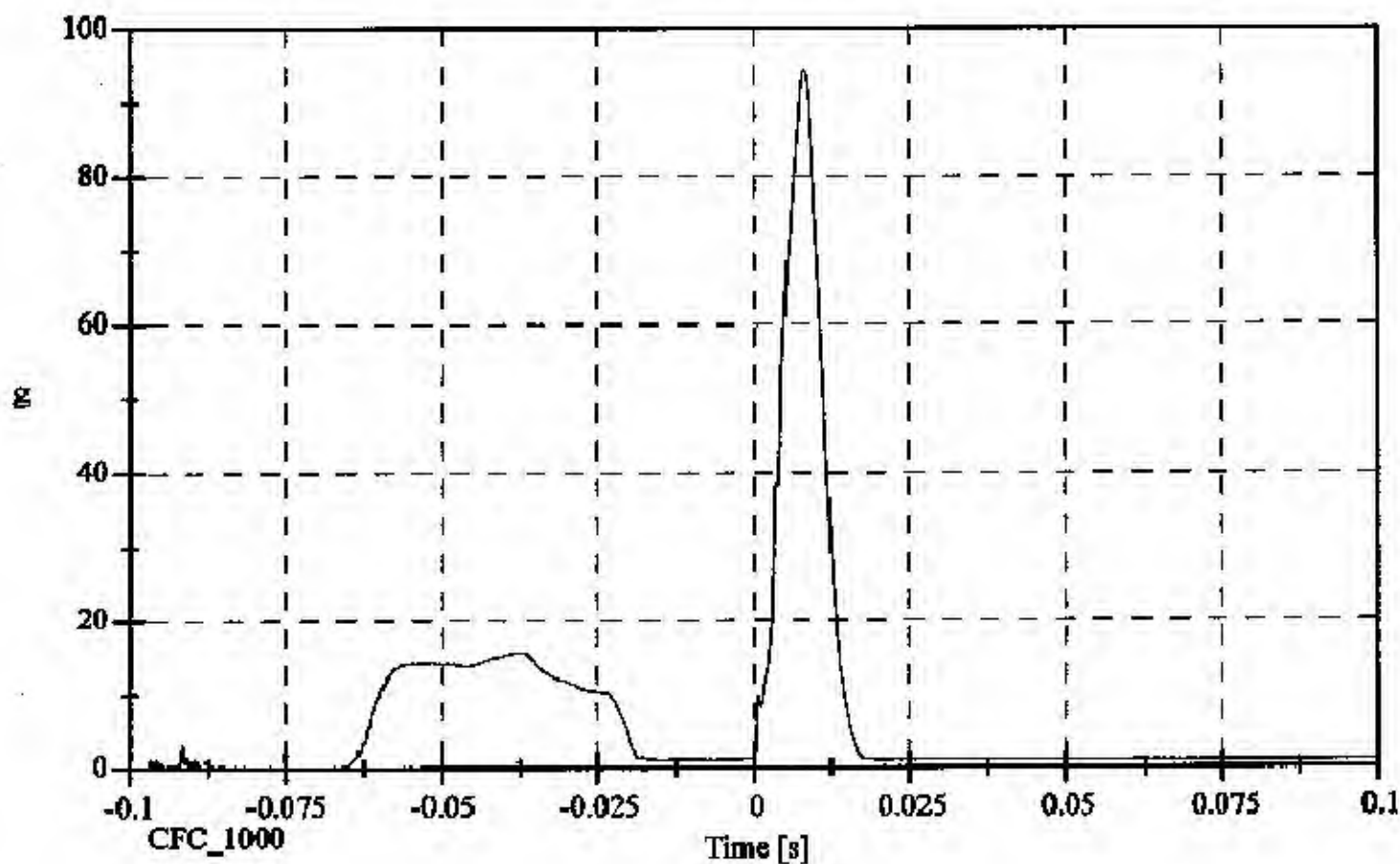
Average Acceleration: 6.8 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 94.4 [g] at 0.008 [s]

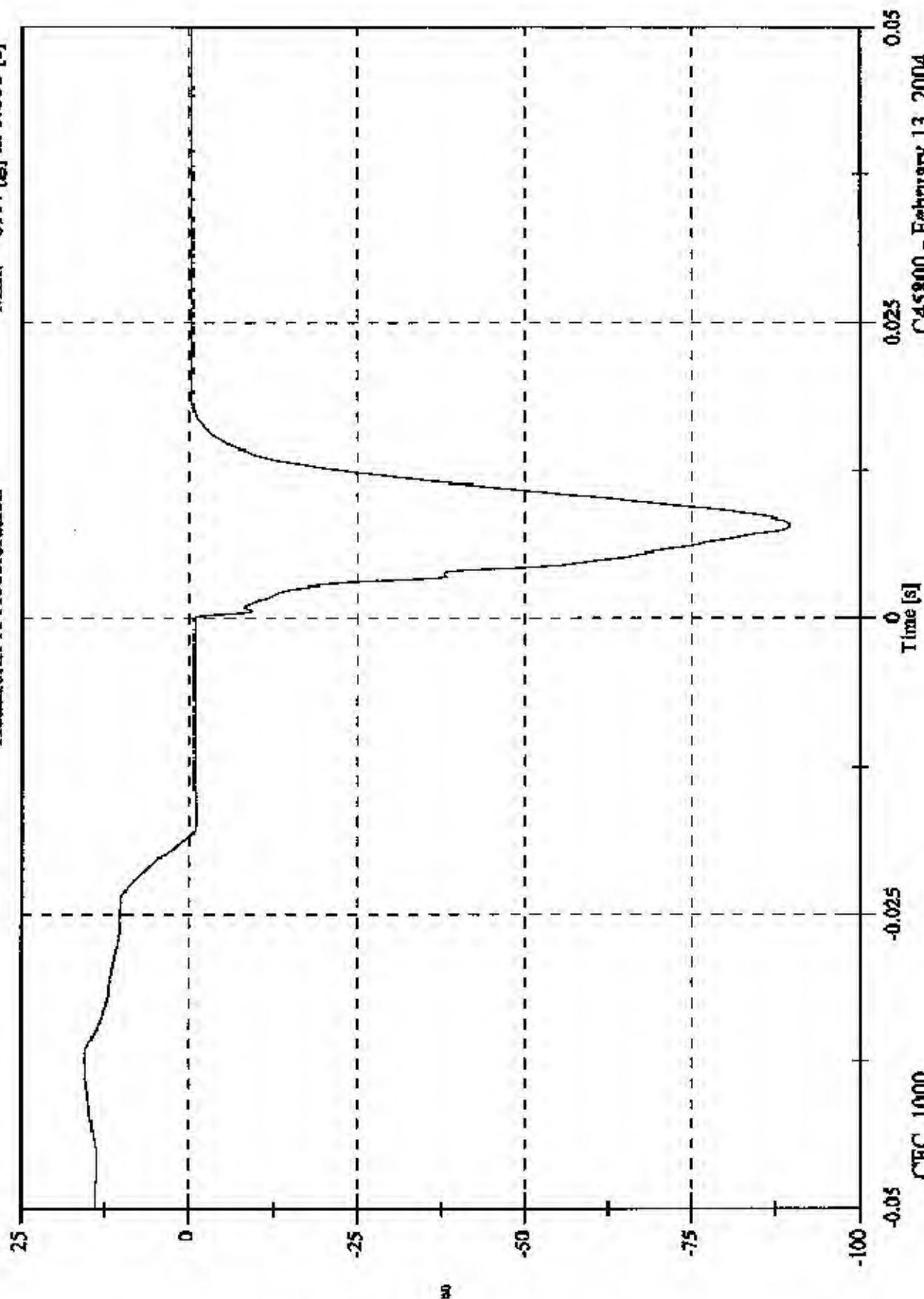
Min: 0.0 [g] at -0.086 [s]



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 15.6 [g] at -0.037 [s]  
Min: -89.4 [g] at 0.008 [s]



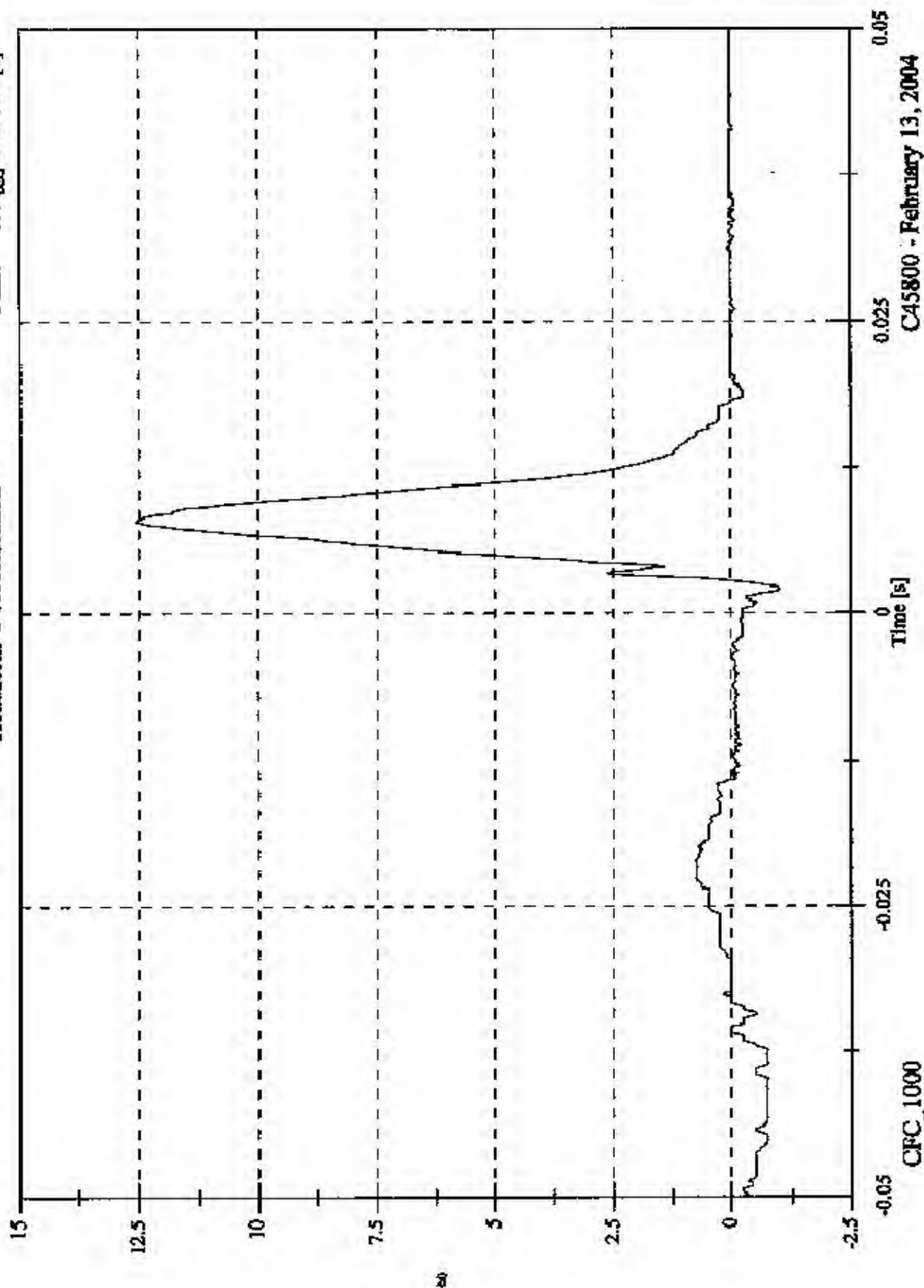
C45800 - February 13, 2004

# FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 12.6 [g] at 0.008 [s]

Min: -1.0 [g] at 0.002 [s]



CFC\_1000

Time [s]

-0.025

0.025

0.05

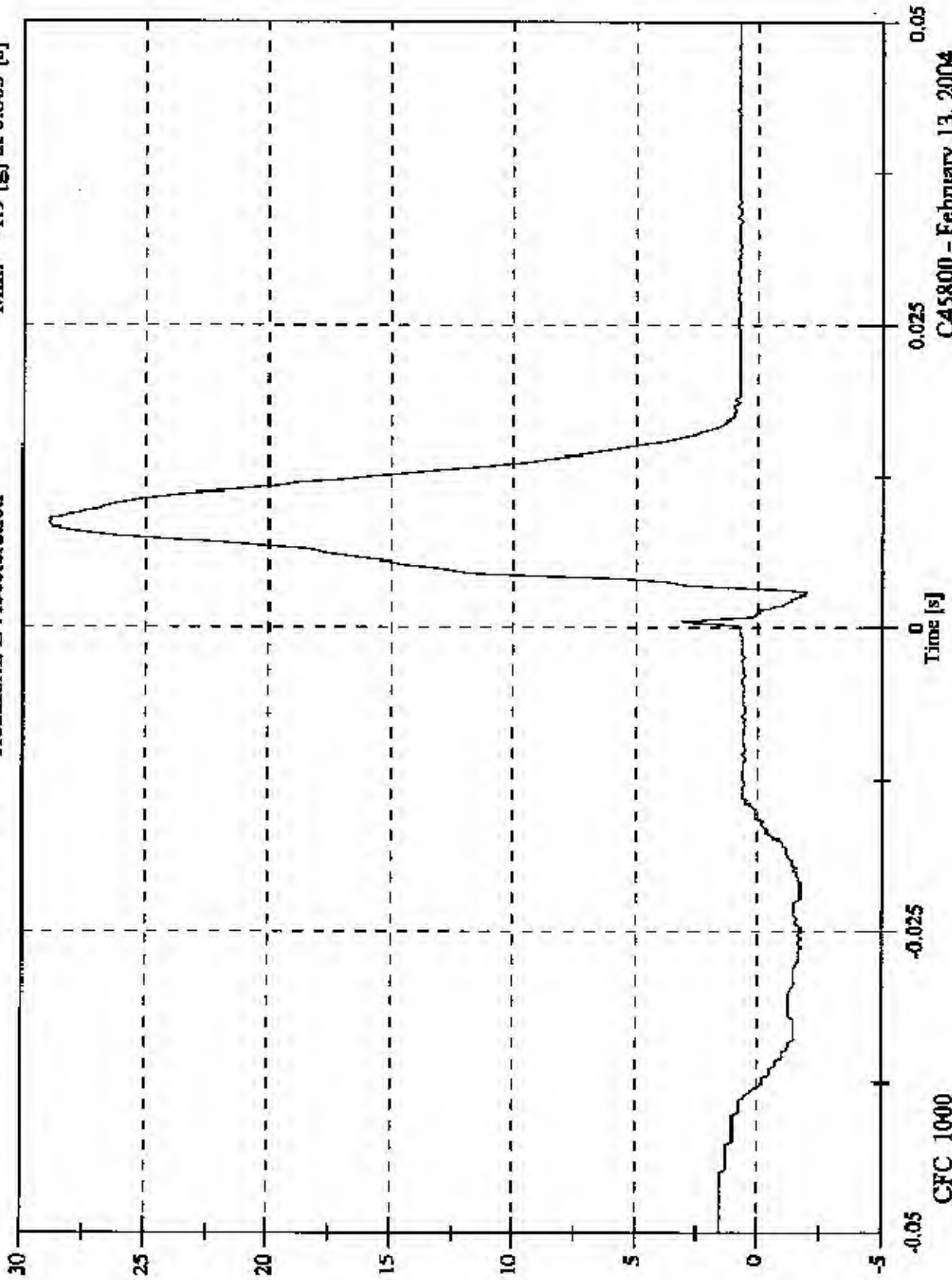
C45800 - February 13, 2004

C45800 Passenger Side SR2B Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 28.9 [g] at 0.009 [s]  
Min: -1.9 [g] at 0.003 [s]

Headform Z Acceleration



CFC\_1000

Time [s]

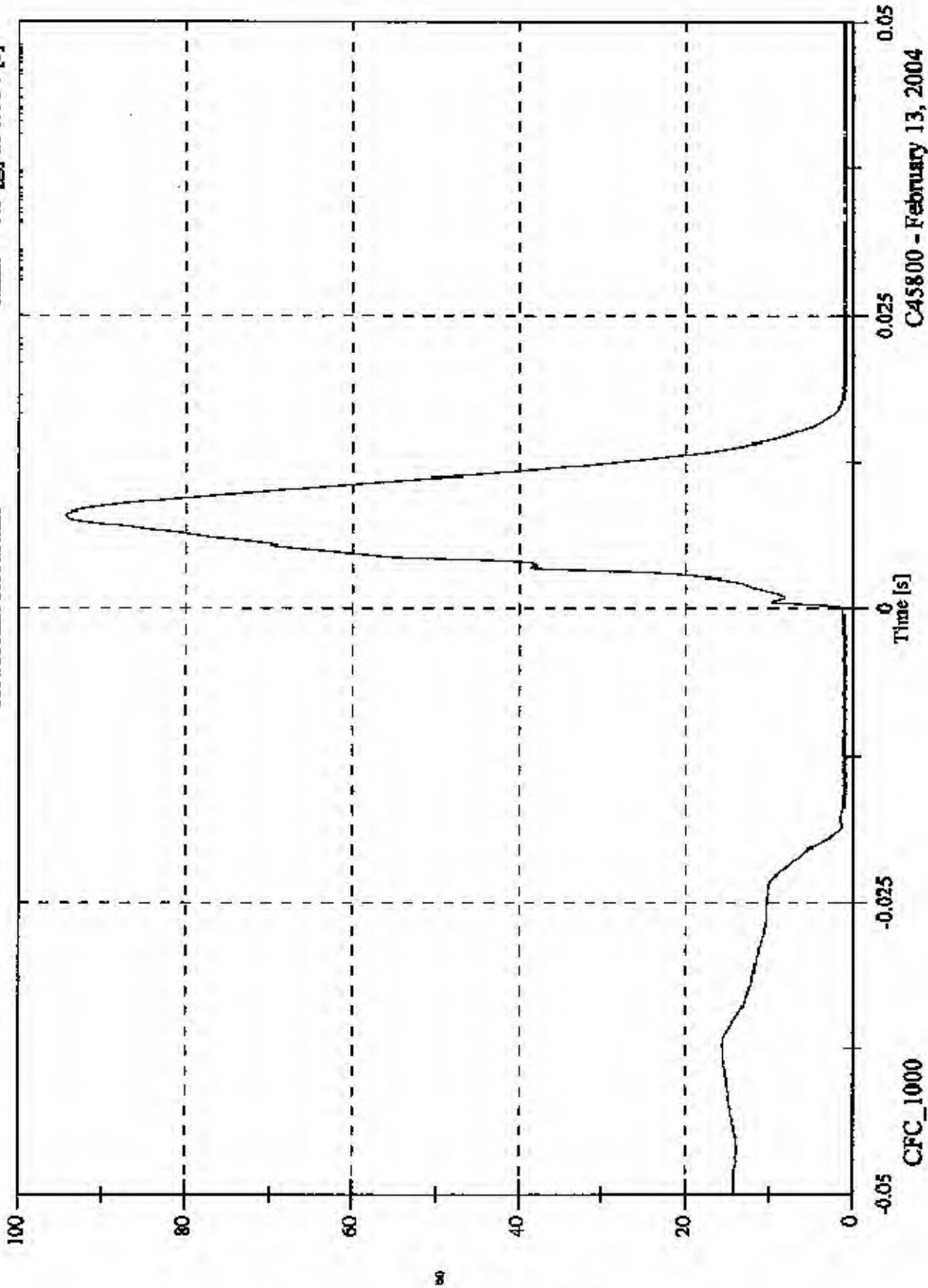
C45800 - February 13, 2004



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 94.4 [g] at 0.008 [s]  
Min: 0.9 [g] at 0.034 [s]

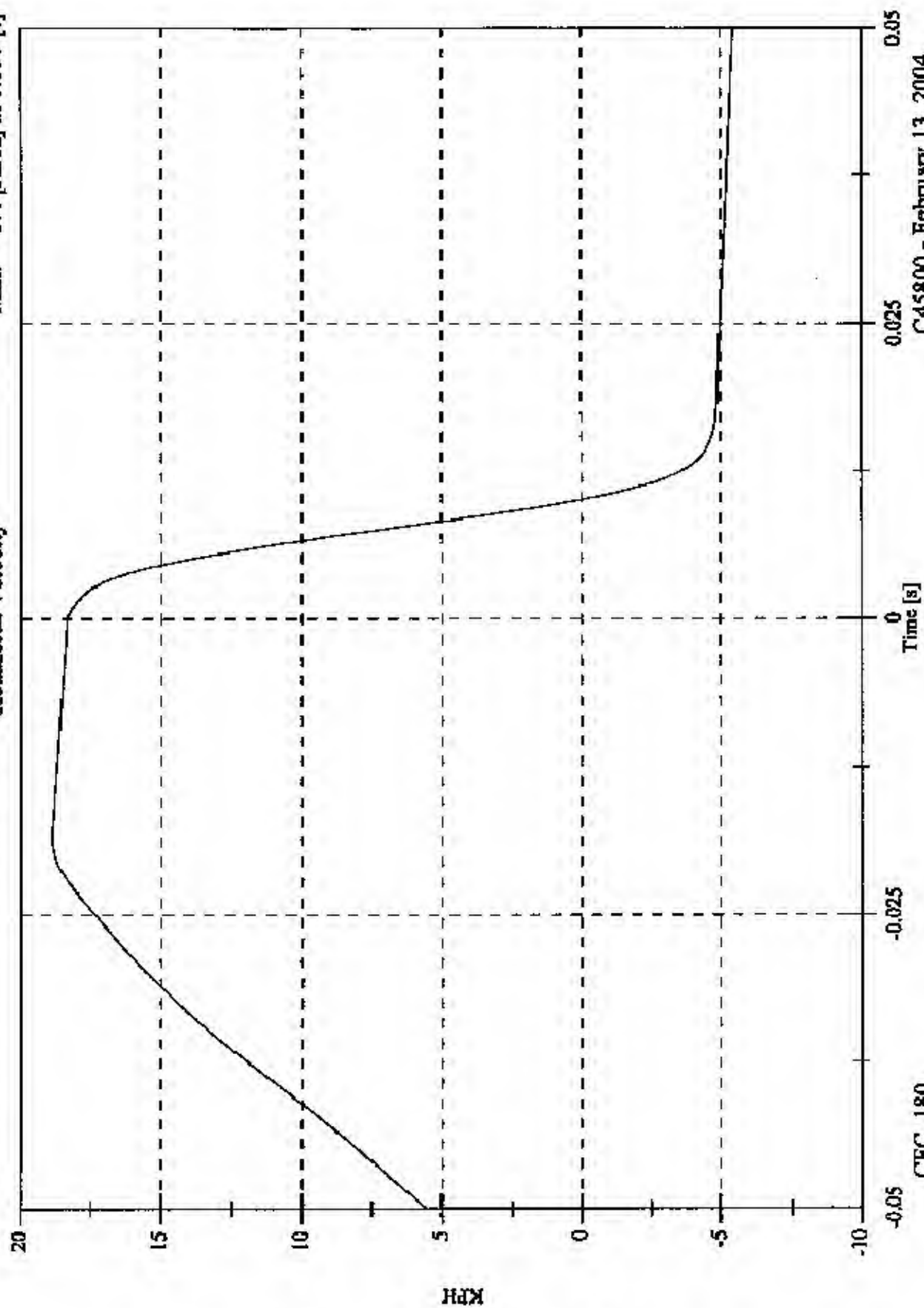


C45800 Passenger Side SR2B Impact Plot #4

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 18.9 [KPH] at -0.018 [s]  
Min: -5.4 [KPH] at 0.050 [s]

Headform Velocity



CFC\_180

FM VSS 201U C45800  
04 VW TOLAREG SR2B  
PRE TEST 13 FEB 04  
HOR 90 VER 50

PRE-IMPACT SR2B (7/10/04) (1/1/04) (1/1/04) (1/1/04)



FMVSS 2011 045000  
01 VW TOUAREG SP28  
POST TEST 13 FEB 04  
HON 90 VER 50

POST-IMPACT SEAT BELT AND/OR OVERHEAD RESTRAINT VER. 10

8750-01



VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	03/03 (SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	07
Test Date:	February 16, 2004
Target Location:	B-Pillar Seat Belt Anchorage
Target Code:	BP2
Horizontal Impact Angle:	270°
Vertical Impact Angle:	3°
Ambient Temperature:	21°C
Relative Humidity:	14%
Time of Impact:	9:35
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	4	<input type="checkbox"/>	mm right	<input checked="" type="checkbox"/> mm left
On Centerline	11		mm up	



POST-IMPACT BP2 HEADFORM

Free Motion HIC	1054.4
HIC(d)	961.9
Impact Velocity (kph)	23.57
HIC T1 (msec)	3.5
HIC T2 (msec)	8.6

# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - BP2

FMH Headform 355

Location: BP2

Test Date: February 16, 2004

Work File: BP2

## TEST RESULTS

Lab Temperature: 21 C

HICd: 961.9

Lab Humidity: 14 %

HIC (36ms): 1054.4

Velocity at Impact: 23.57 KPH

t1: 3.5 msec

t2: 8.6 msec

Free Flight Distance: 223.53 mm

Duration: 5.1 msec

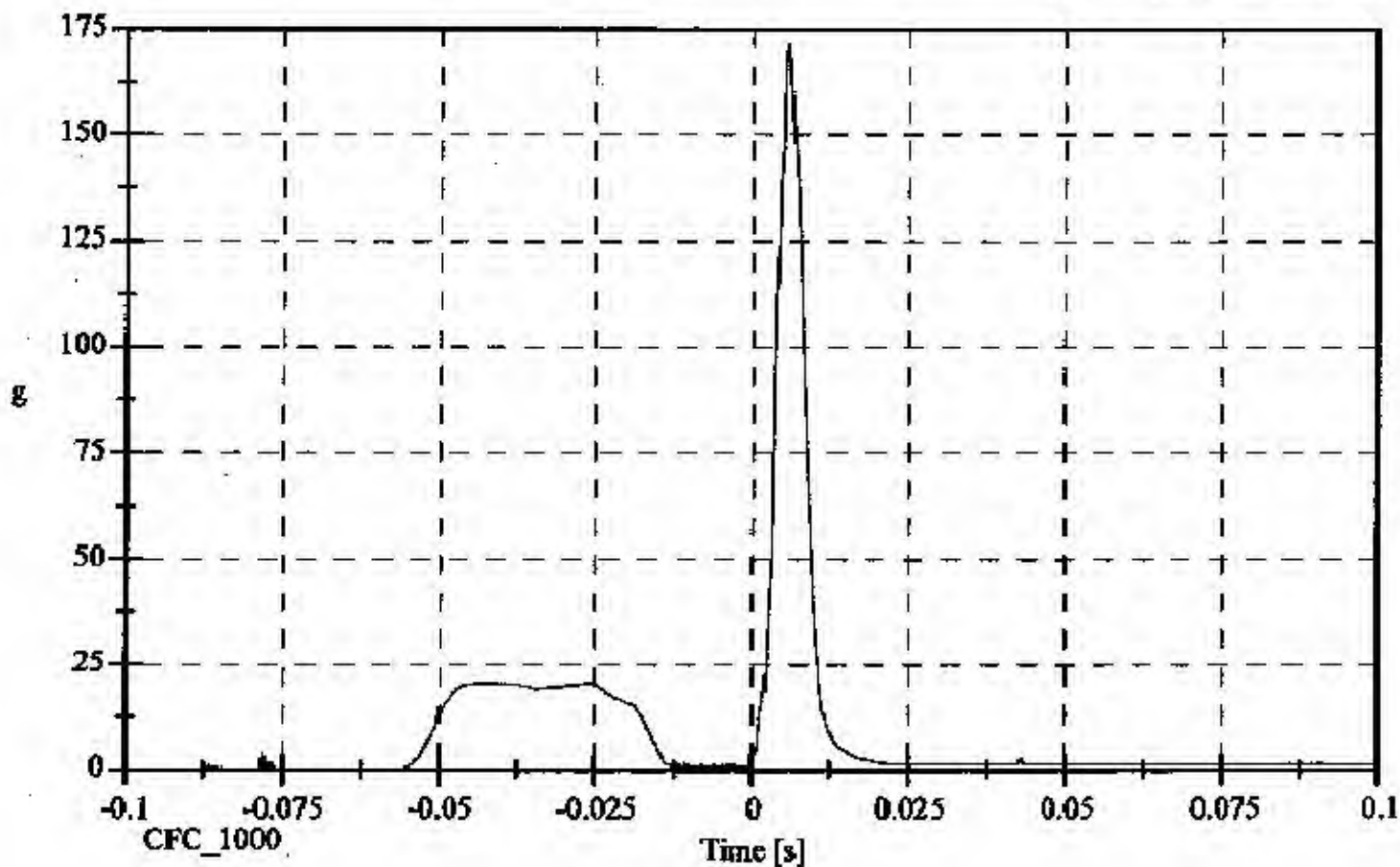
Average Acceleration: 8.7 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 171.4 [g] at 0.006 [s]

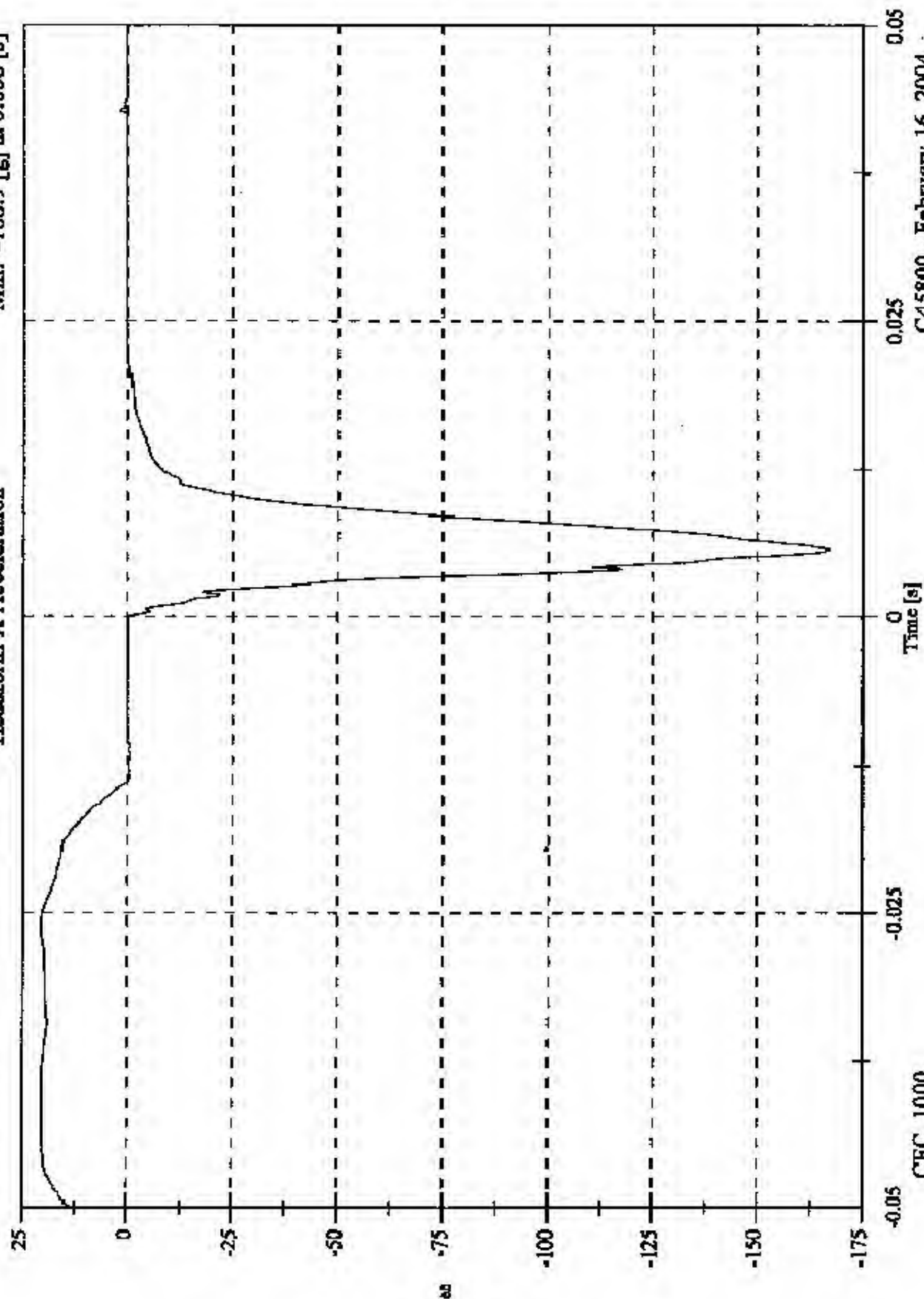
Min: 0.0 [g] at -0.061 [s]



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 20.7 [g] at -0.026 [s]  
Min: -166.9 [g] at 0.006 [s]

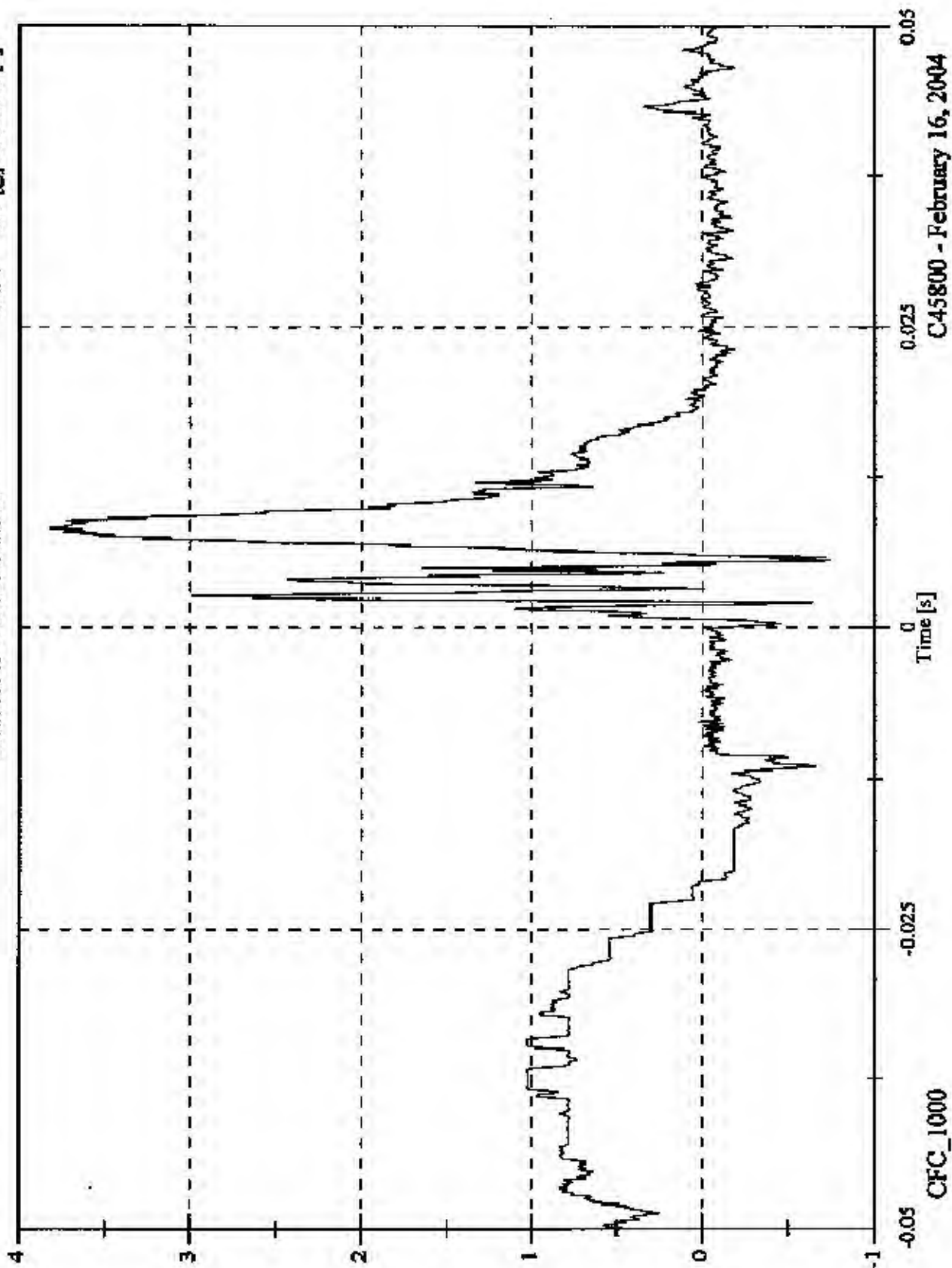


CFC 1000

# FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 3.8 [g] at 0.008 [s]  
Min: -0.7 [g] at 0.006 [s]



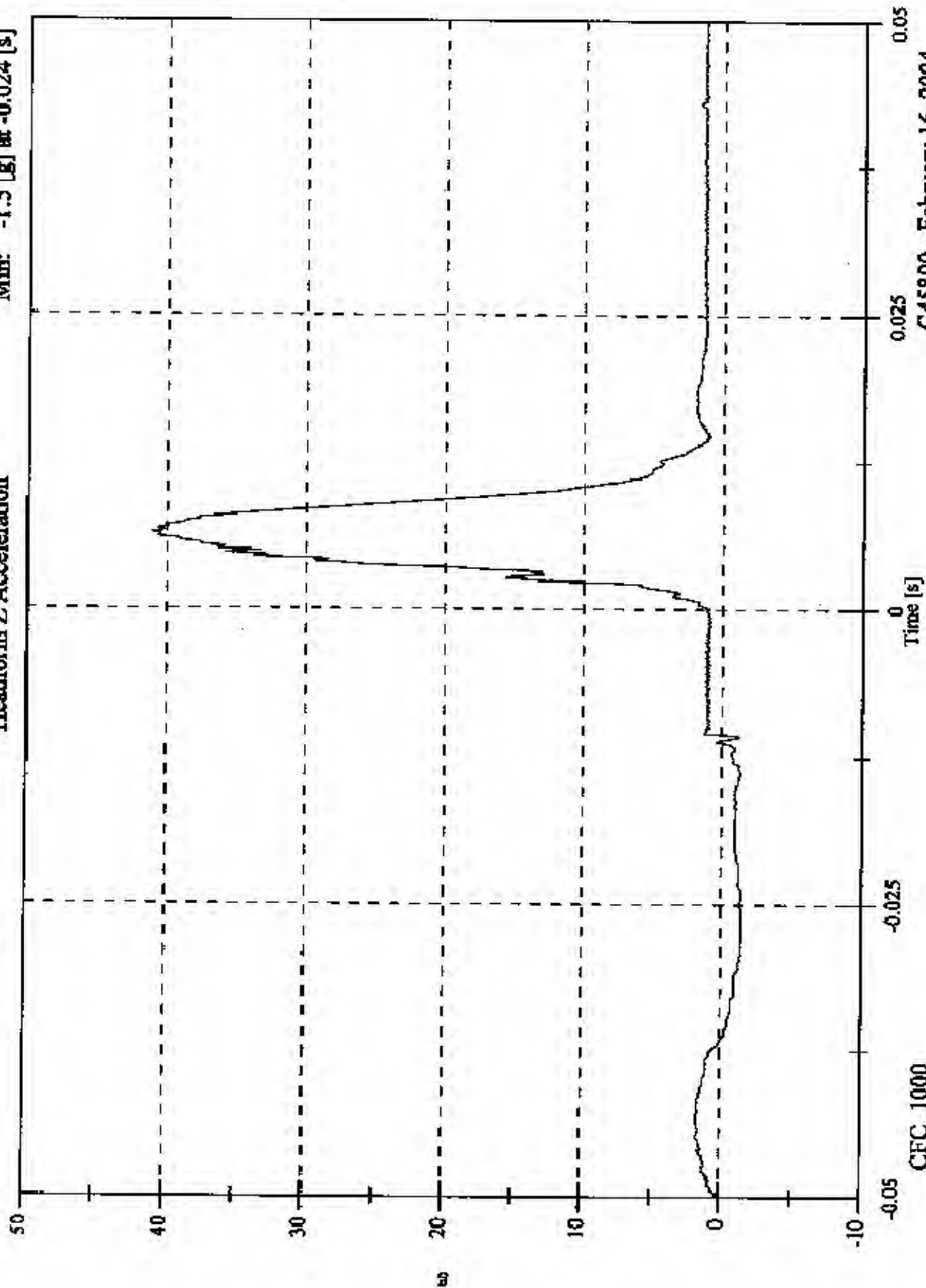
C45800 Driver Side BP2 Impact Plot #2



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 41.0 [g] at 0.006 [s]  
Min: -1.5 [g] at -0.024 [s]



CFC\_1000

-0.025

Time [s]

0.025

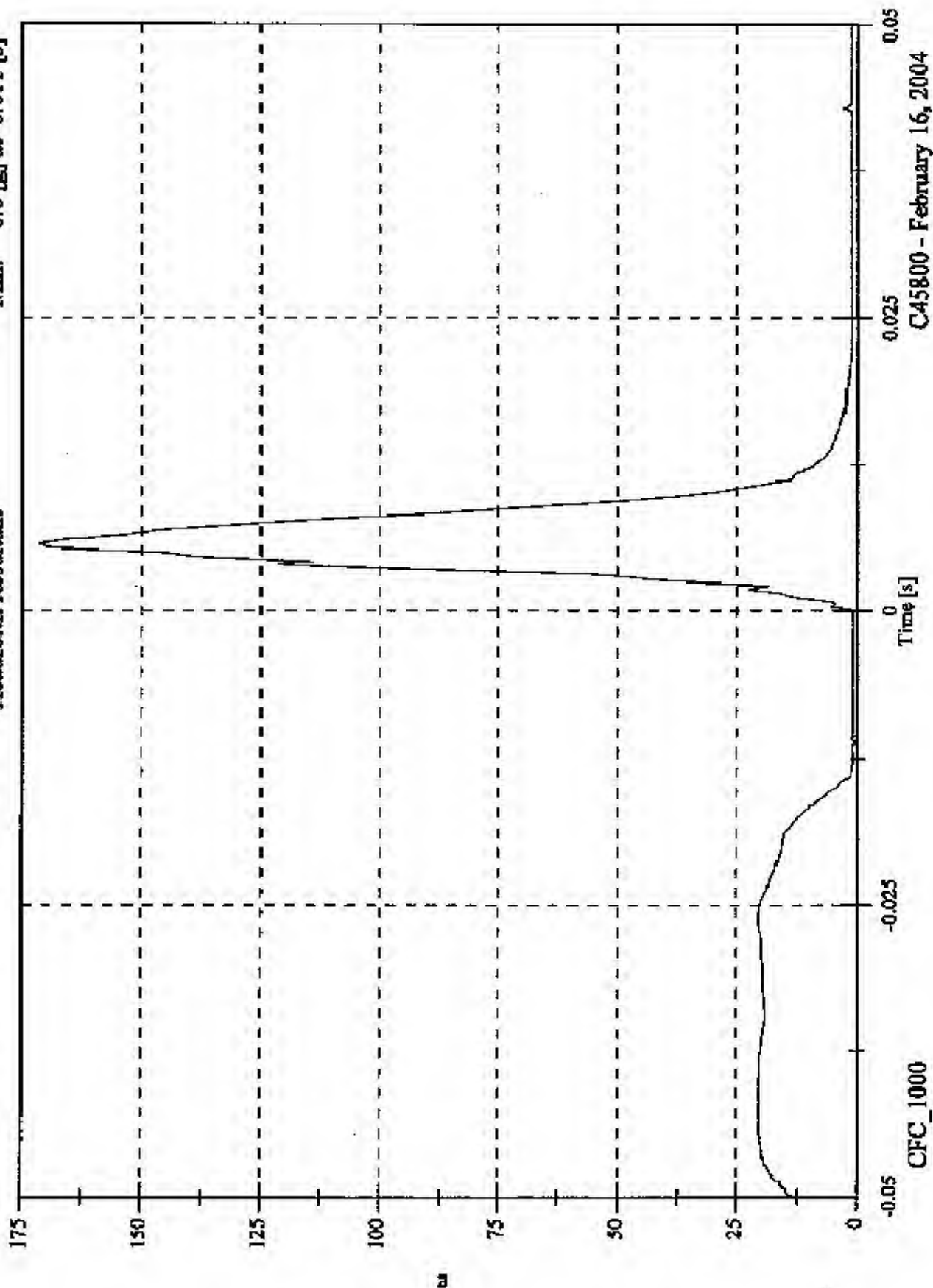
0.05

C45800 - February 16, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 171.4 [g] at 0.006 [s]  
Min: 0.6 [g] at -0.011 [s]

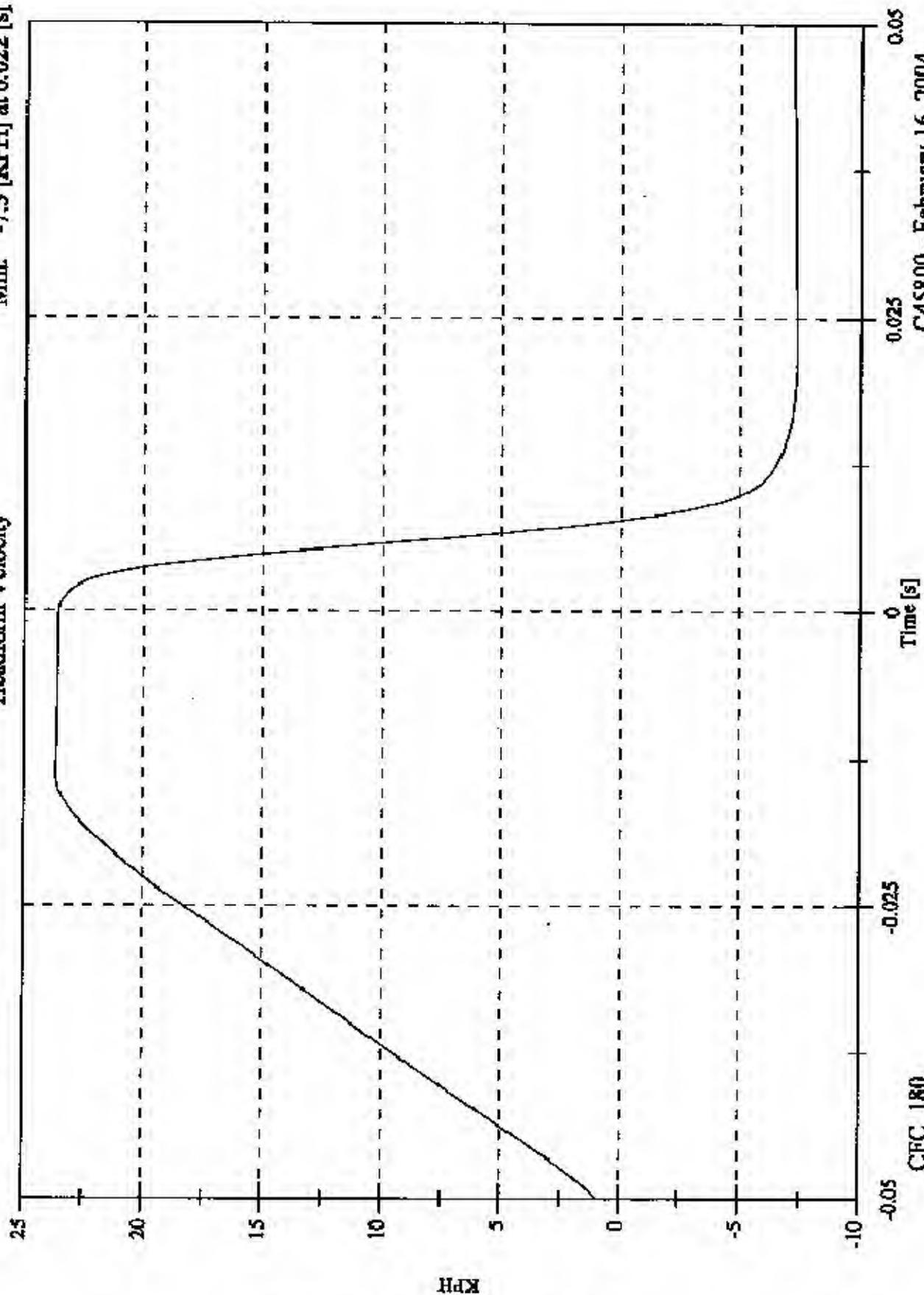


C45800 Driver Side BP2 Impact Plot #4

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 23.7 [KPH] at -0.014 [s]  
Min: -7.3 [KPH] at 0.022 [s]

Headform Velocity



C45800 Driver Side BP2 Impact Plot #5



FMVSS 201U C45800  
04 VW TOUAREG BP2  
PRE TEST 16 FEB 04  
HOR 270 VER 3

FMVSS 201U

8710-07





VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	05/03(SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	08
Test Date:	February 16, 2004
Target Location:	Upper Roof
Target Code:	UROF
Horizontal Impact Angle:	270°
Vertical Impact Angle:	47°
Ambient Temperature:	21°C
Relative Humidity:	14%
Time of Impact:	10:35
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	4	mm right	x mm left
On Centerline	29	mm up	



POST-IMPACT UROF HEADFORM

Free Motion HIC	507.4
HIC(d)	549.2
Impact Velocity (kph)	23.81
HIC T1 (msec)	5.0
HIC T2 (msec)	14.1

# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - UROP

FMH Headform 805

Location: UROP

Test Date: February 16, 2004

Work File: UROP

## TEST RESULTS

Lab Temperature: 21 C

HICd: 549.2

Lab Humidity: 14 %

HIC (36ms): 507.4

Velocity at Impact: 23.81 KPH

t1: 5.0 msec

t2: 14.0 msec

Free Flight Distance: 224.59 mm

Duration: 9.0 msec

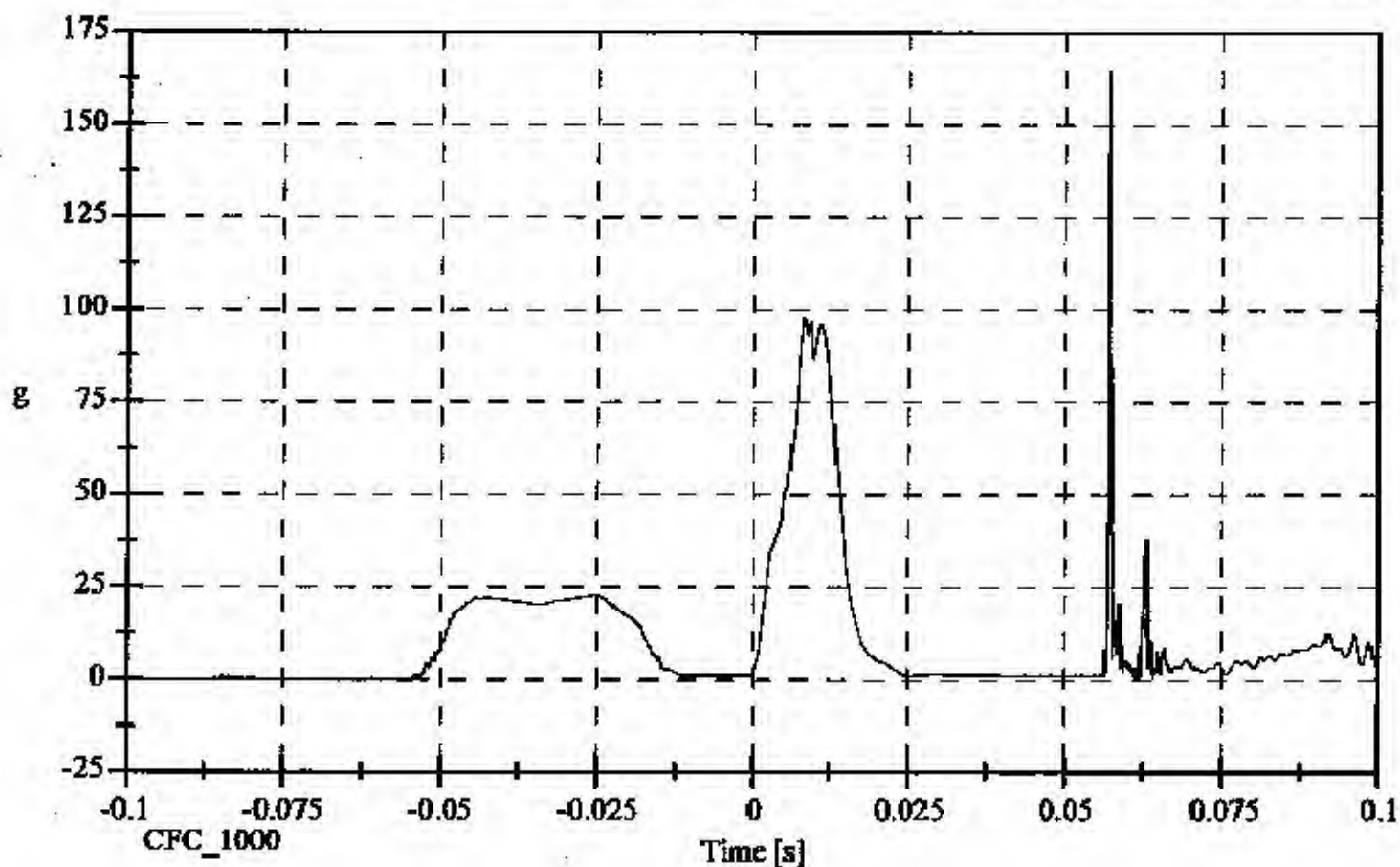
Average Acceleration: 10.3 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 165.1 [g] at 0.057 [s]

Min: -0.0 [g] at -0.099 [s]

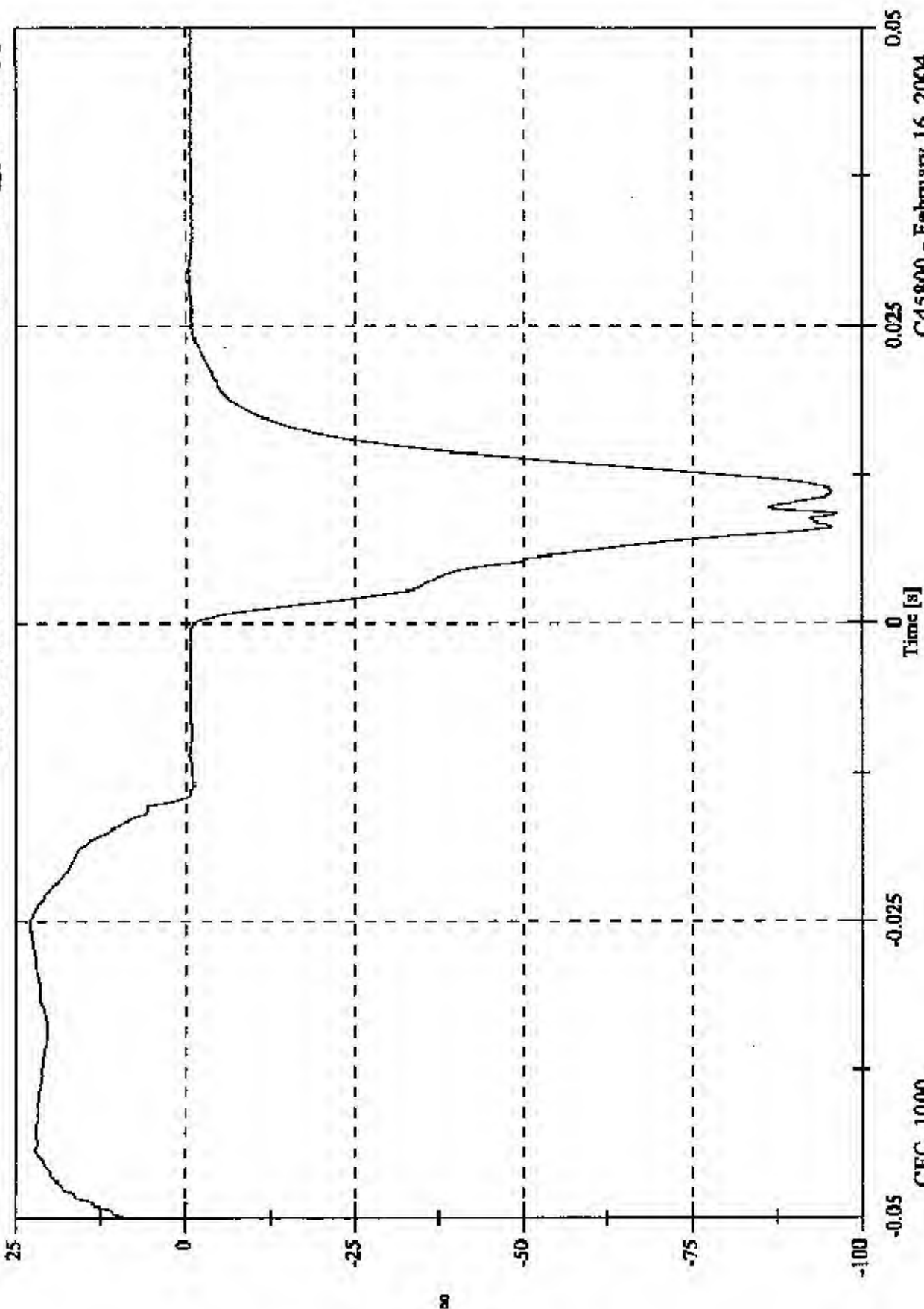




FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 23.0 [g] at -0.025 [s]  
Min: -96.3 [g] at 0.009 [s]



CFC\_1000

Time [s]

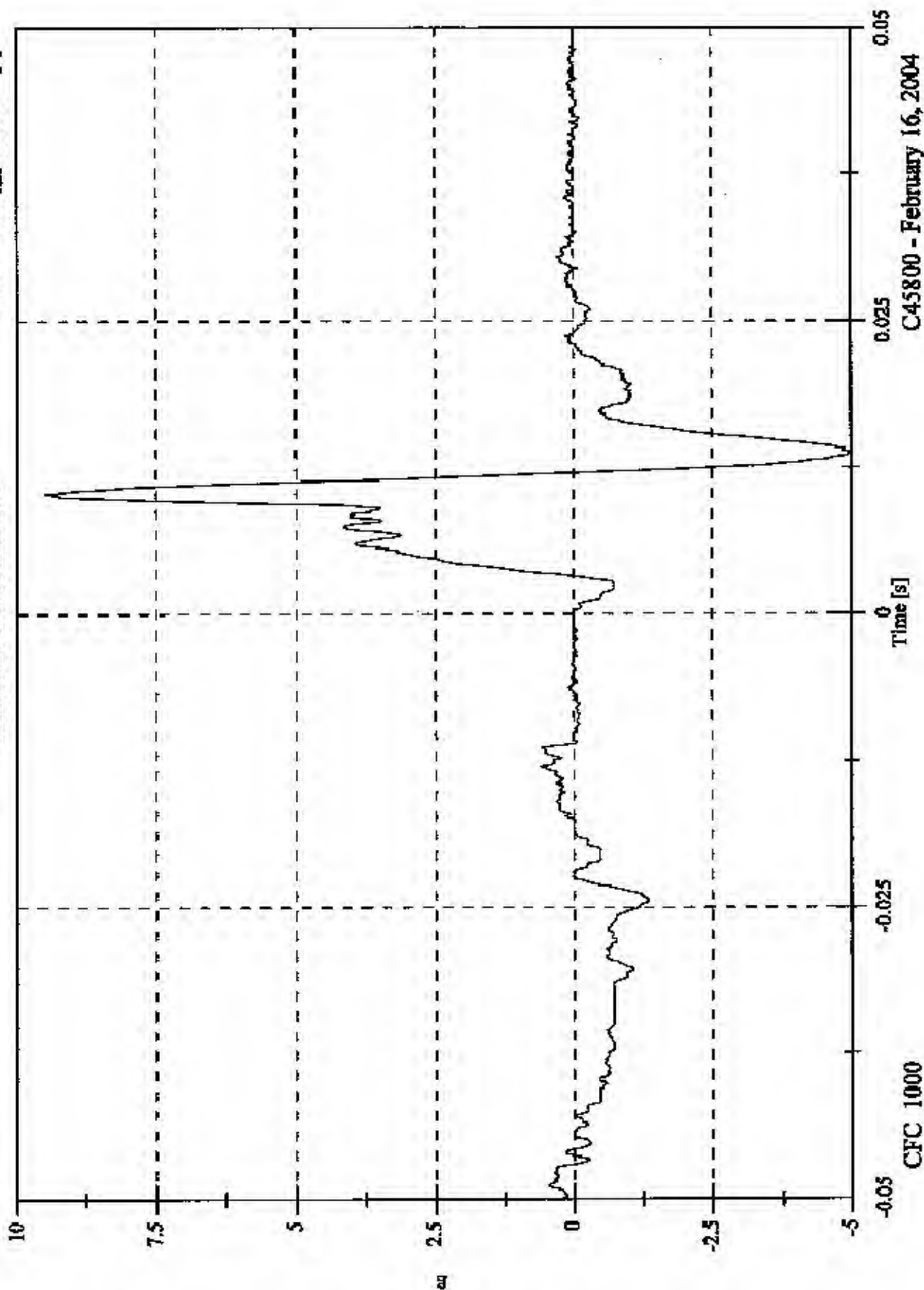
C45800 - February 16, 2004



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 9.5 [g] at 0.010 [s]  
Min: -5.0 [g] at 0.014 [s]



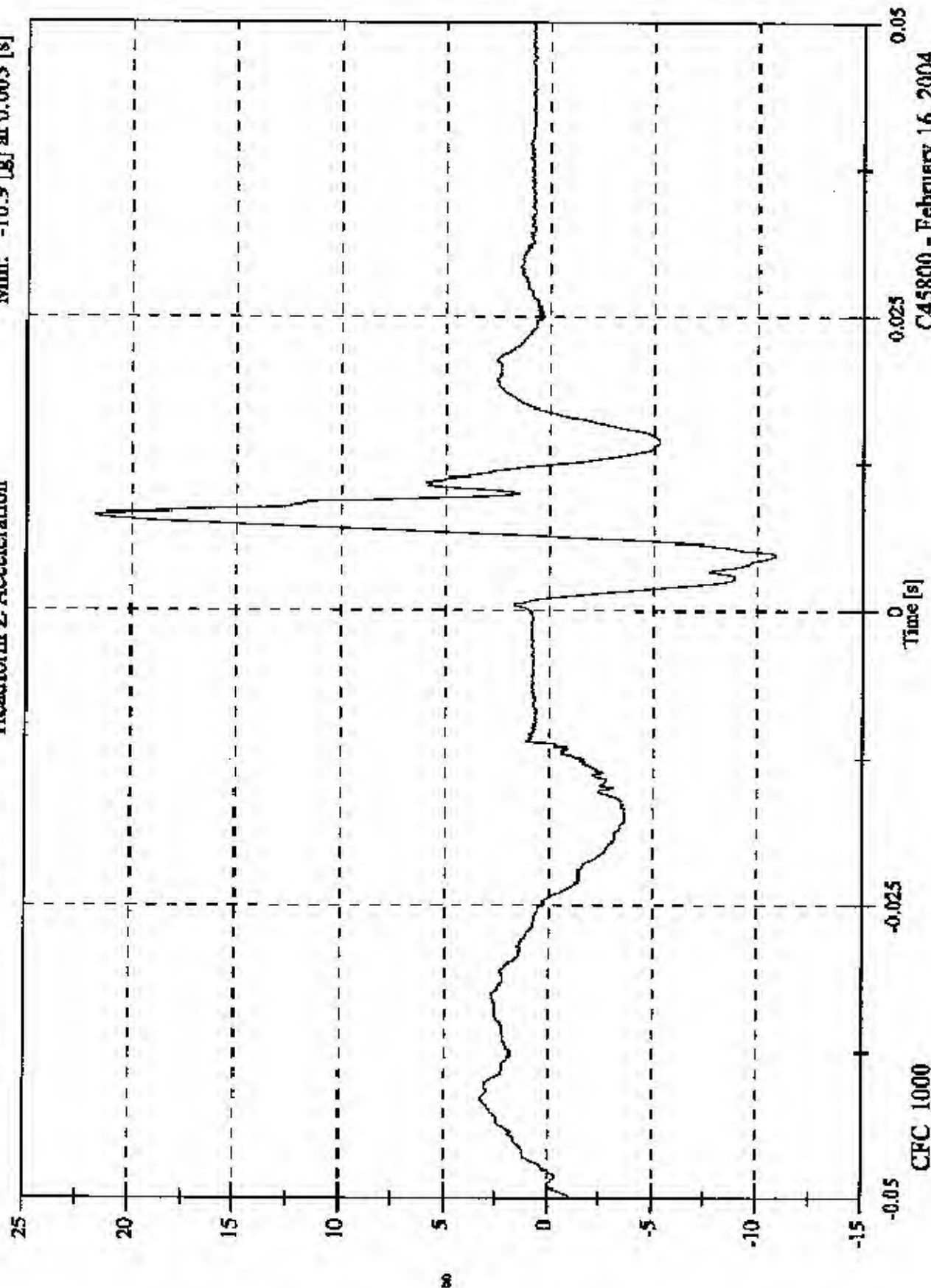
C45800 - February 16, 2004

C45800 Driver Side UROP Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 21.7 [g] at 0.008 [s]  
Min: -10.9 [g] at 0.005 [s]

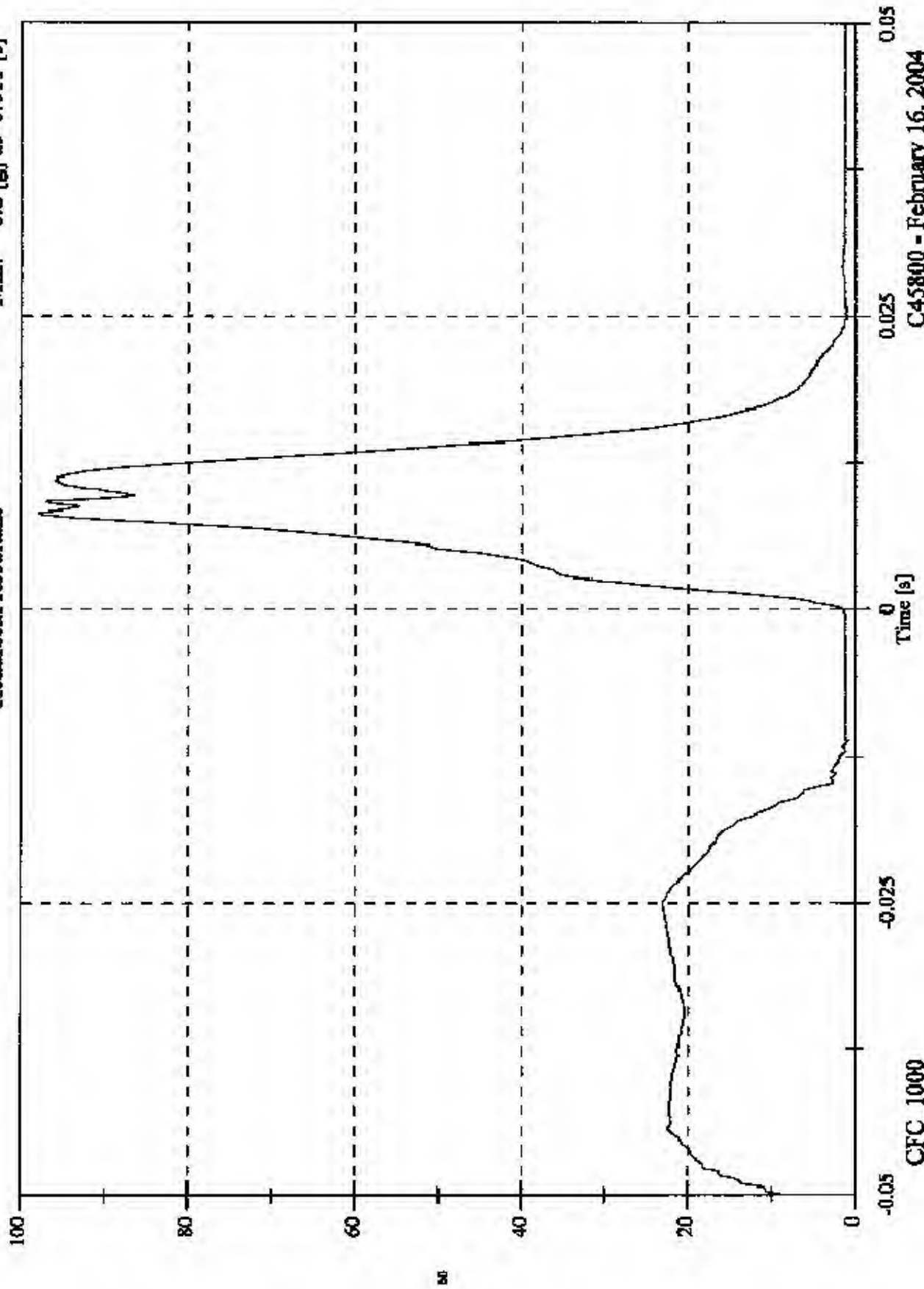


C45800 - February 16, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 98.0 [g] at 0.008 [s]  
Min: 0.8 [g] at -0.011 [s]

Headform Resultant



CFC\_1000

-0.025

0.025

0.05

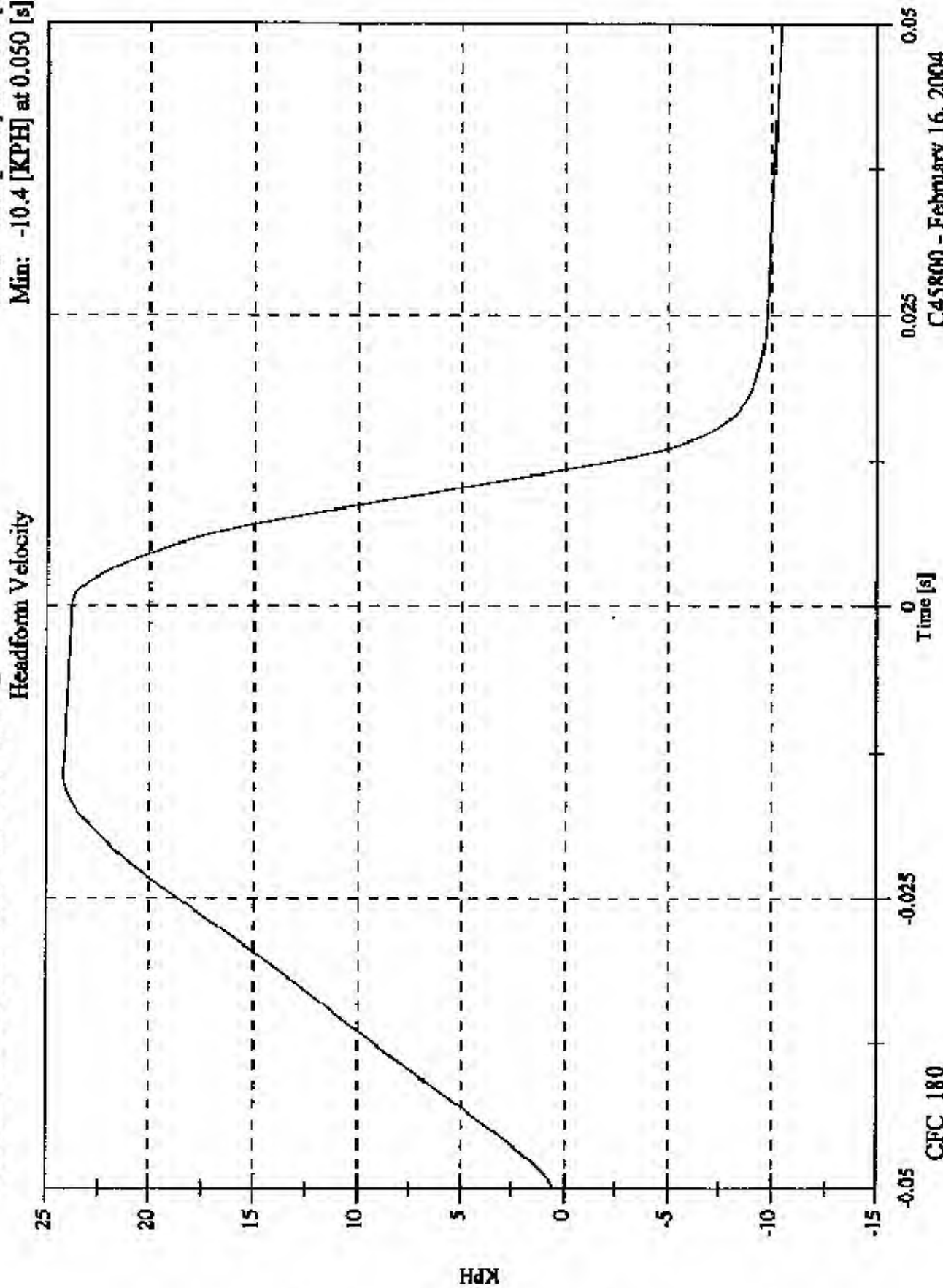
Time [s]

C45800 - February 16, 2004

C45800 Driver Side UROP Impact Plot #4

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 24.2 [KPH] at -0.014 [s]  
Min: -10.4 [KPH] at 0.050 [s]



C45800 Driver Side UROP Impact Plot #5

C45800 - February 16, 2004





FMVSS 2010 C45800  
04 VW TOLAREG UROP  
PRE TEST 18 FEB 04  
HOR270 VER 47

FOR IMPACT LAB

5/31/07



FM VSS 201U C45800  
04 VW TOUAREG UROP  
POST TEST 16 FEB 04  
HOR 270 VER 47

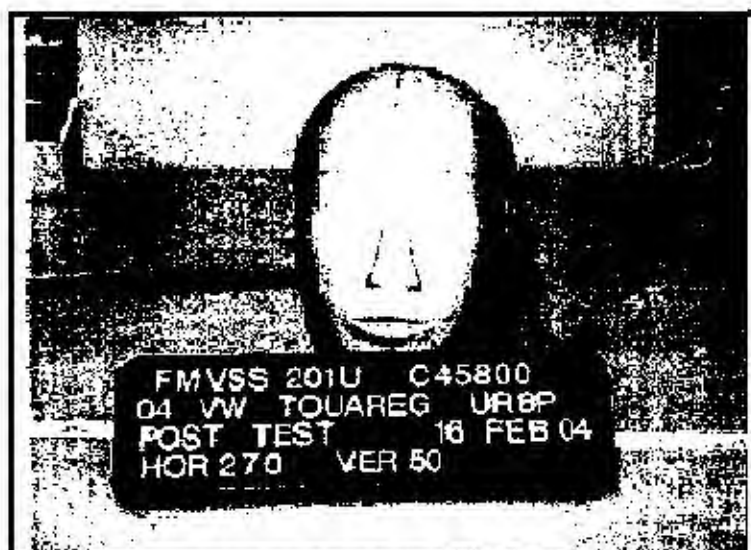
NAV IMPACT DRIP

8770-07

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	03/03(SBB CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	09
Test Date:	February 16, 2004
Target Location:	Upper Roof
Target Code:	URBP
Horizontal Impact Angle:	270°
Vertical Impact Angle:	50°
Ambient Temperature:	21°C
Relative Humidity:	14%
Time of Impact:	11:15
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	7	<input type="checkbox"/>	mm right	<input checked="" type="checkbox"/> mm left
On Centerline	53		mm up	



POST-IMPACT URBP HEADFORM

Free Motion HIC	942.3
HIC(d)	877.3
Impact Velocity (kph)	23.56
HIC T1 (msec)	3.1
HIC T2 (msec)	9.8



# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - URBP

FMH Headform 1255

Location: URBP

Test Date: February 16, 2004

Work File: URBP

## TEST RESULTS

Lab Temperature: 21 C

HICd: 877.3

Lab Humidity: 14 %

HIC (36ms): 942.3

Velocity at Impact: 23.56 KPH

t1: 3.1 msec

t2: 9.8 msec

Free Flight Distance: 223.67 mm

Duration: 6.7 msec

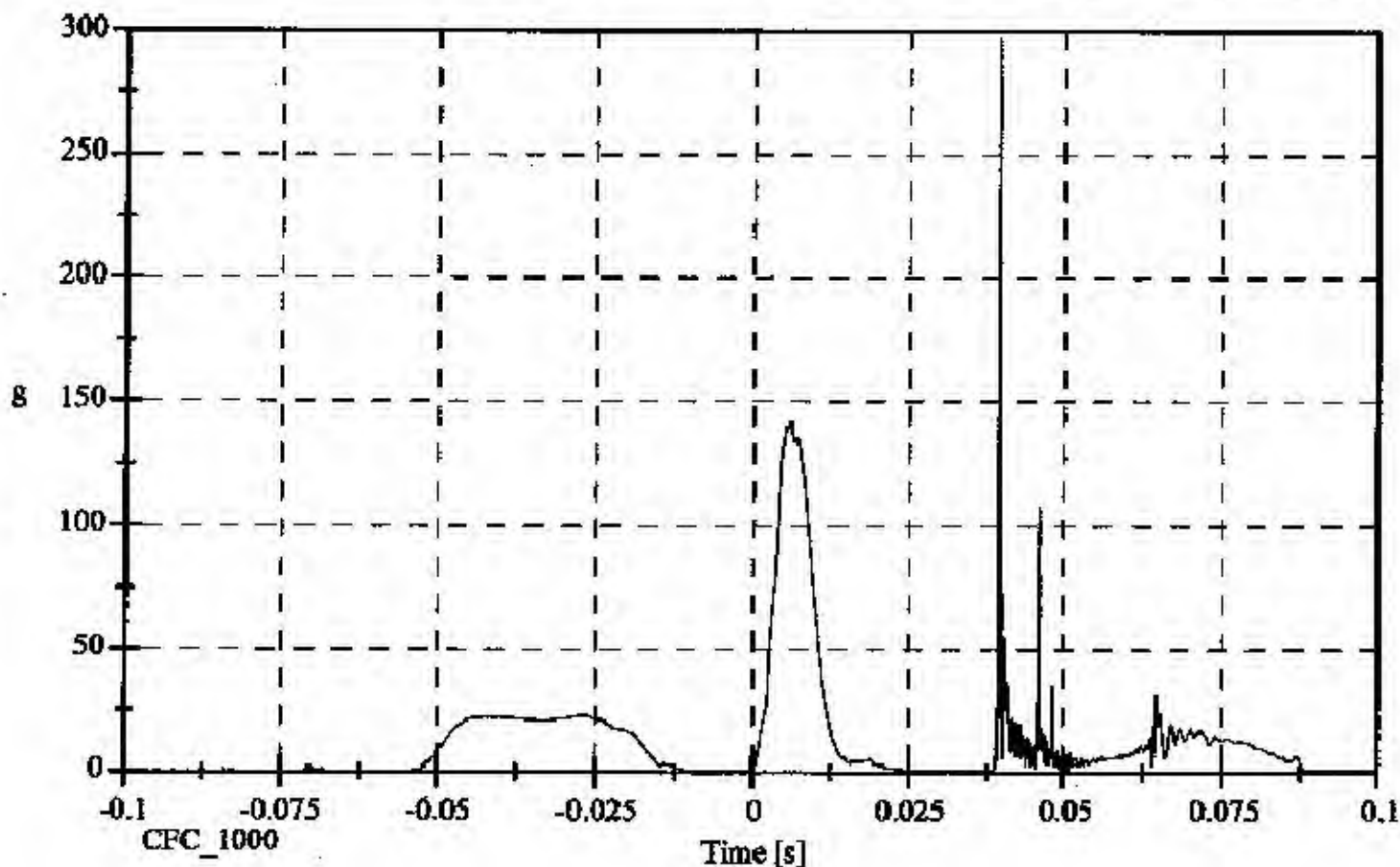
Average Acceleration: 11.8 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 297.2 [g] at 0.039 [s]

Min: 0.0 [g] at -0.092 [s]

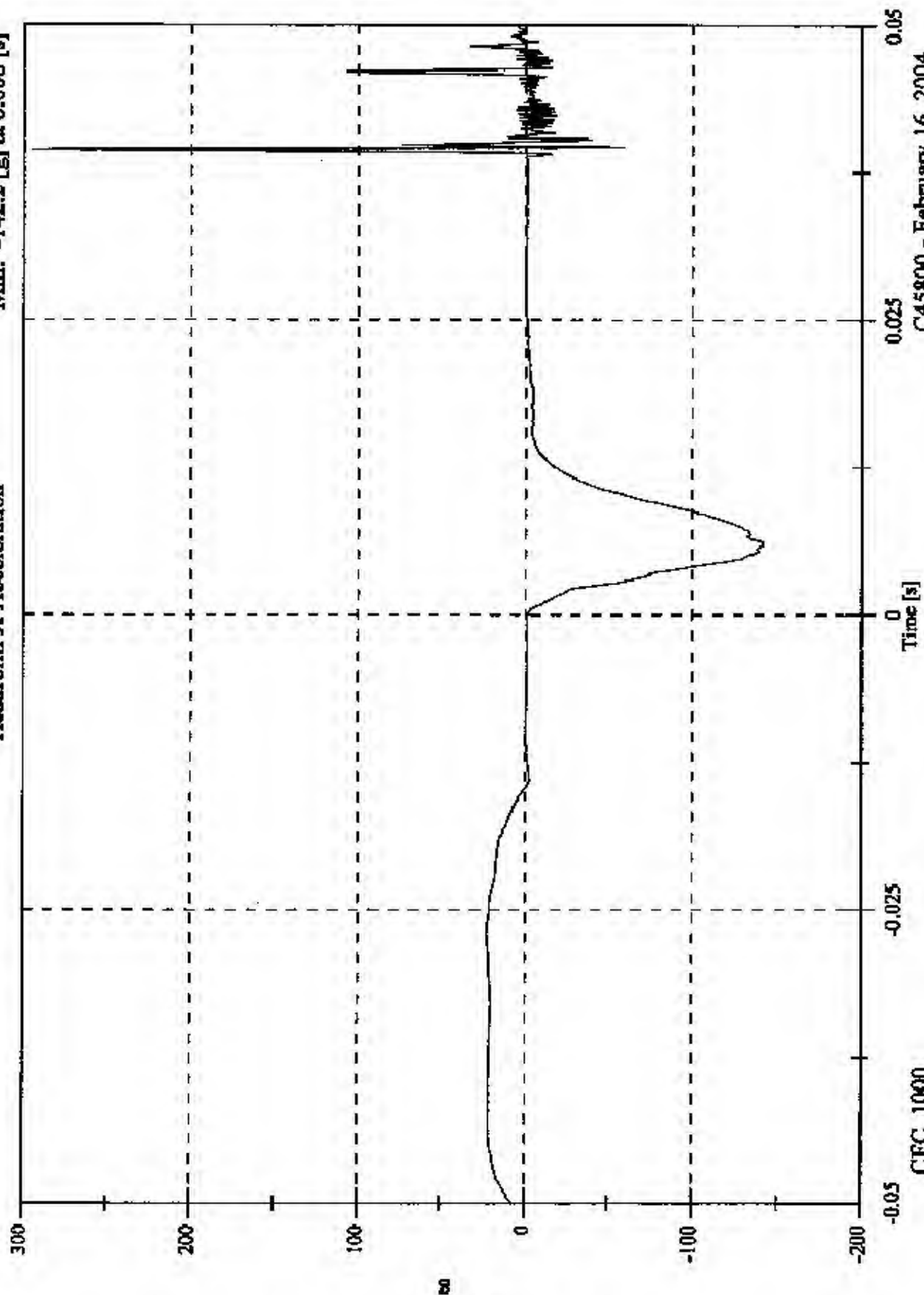




FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 296.1 [g] at 0.039 [s]  
Min: -142.2 [g] at 0.006 [s]



CFC\_1000

Time [s]

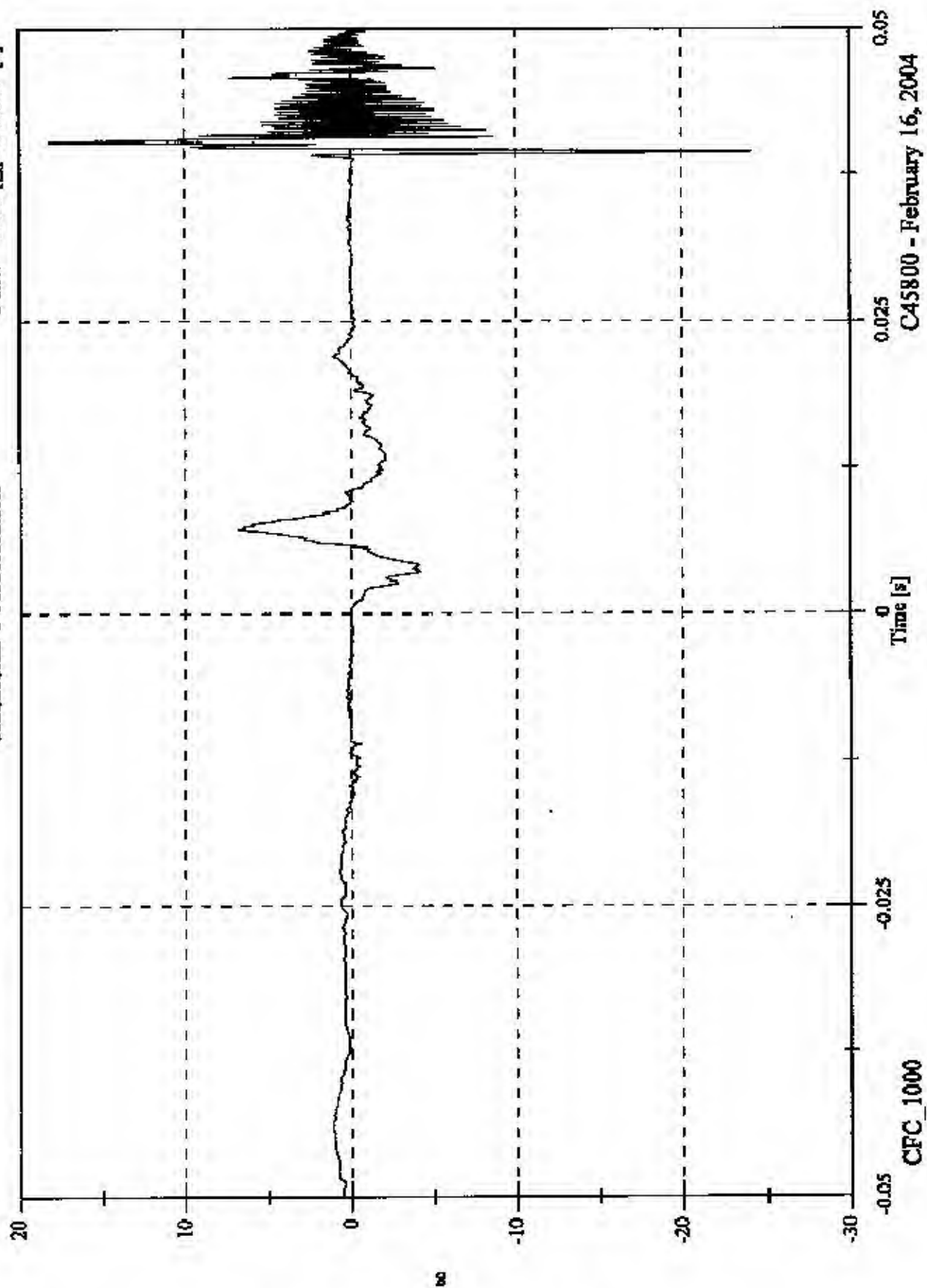
C45800 - February 16, 2004

C45800 Driver Side URBP Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 18.2 [g] at 0.040 [s]  
Min: -24.1 [g] at 0.039 [s]

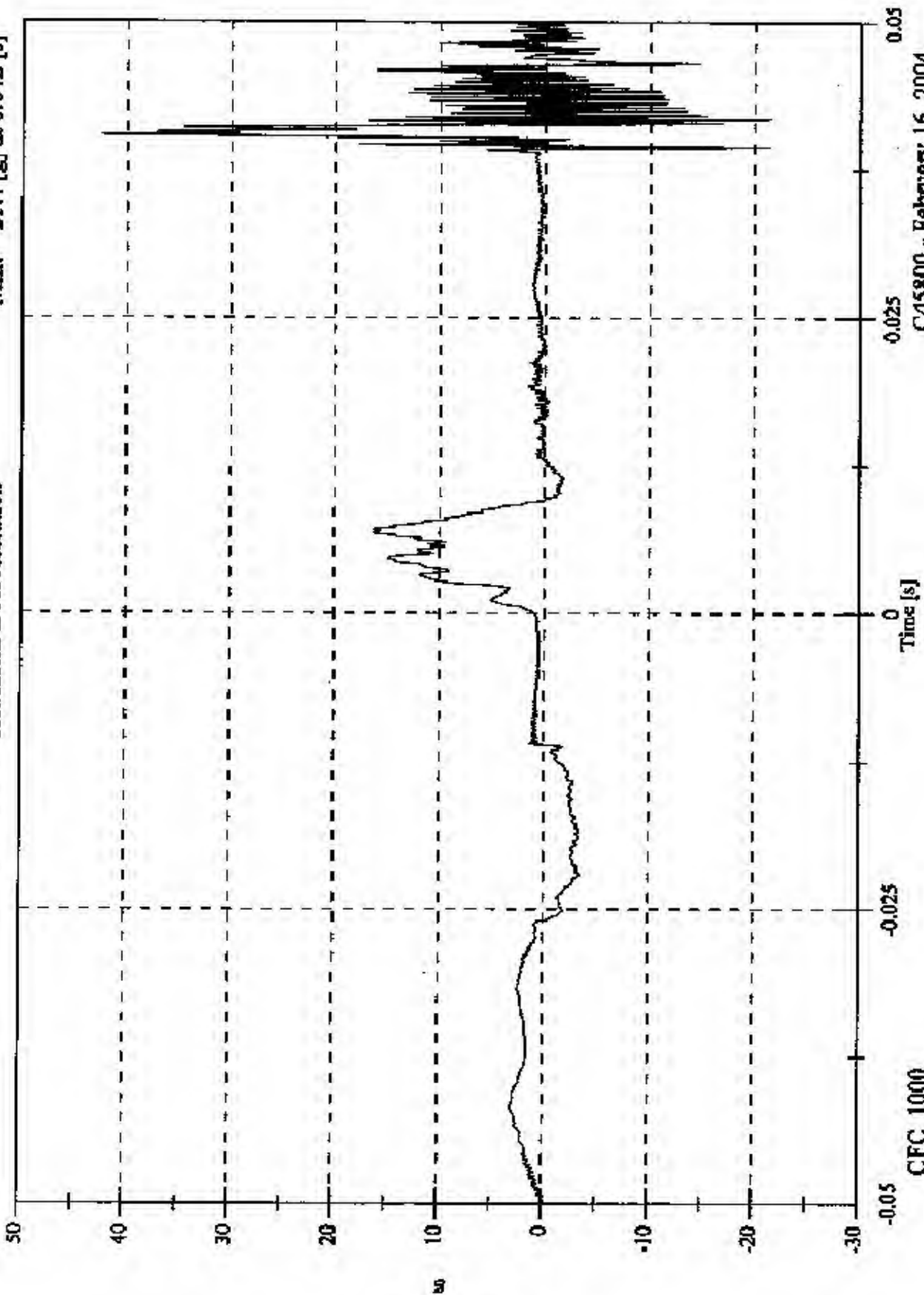


C45800 - February 16, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 42.5 [g] at 0.040 [s]  
Min: -21.4 [g] at 0.042 [s]

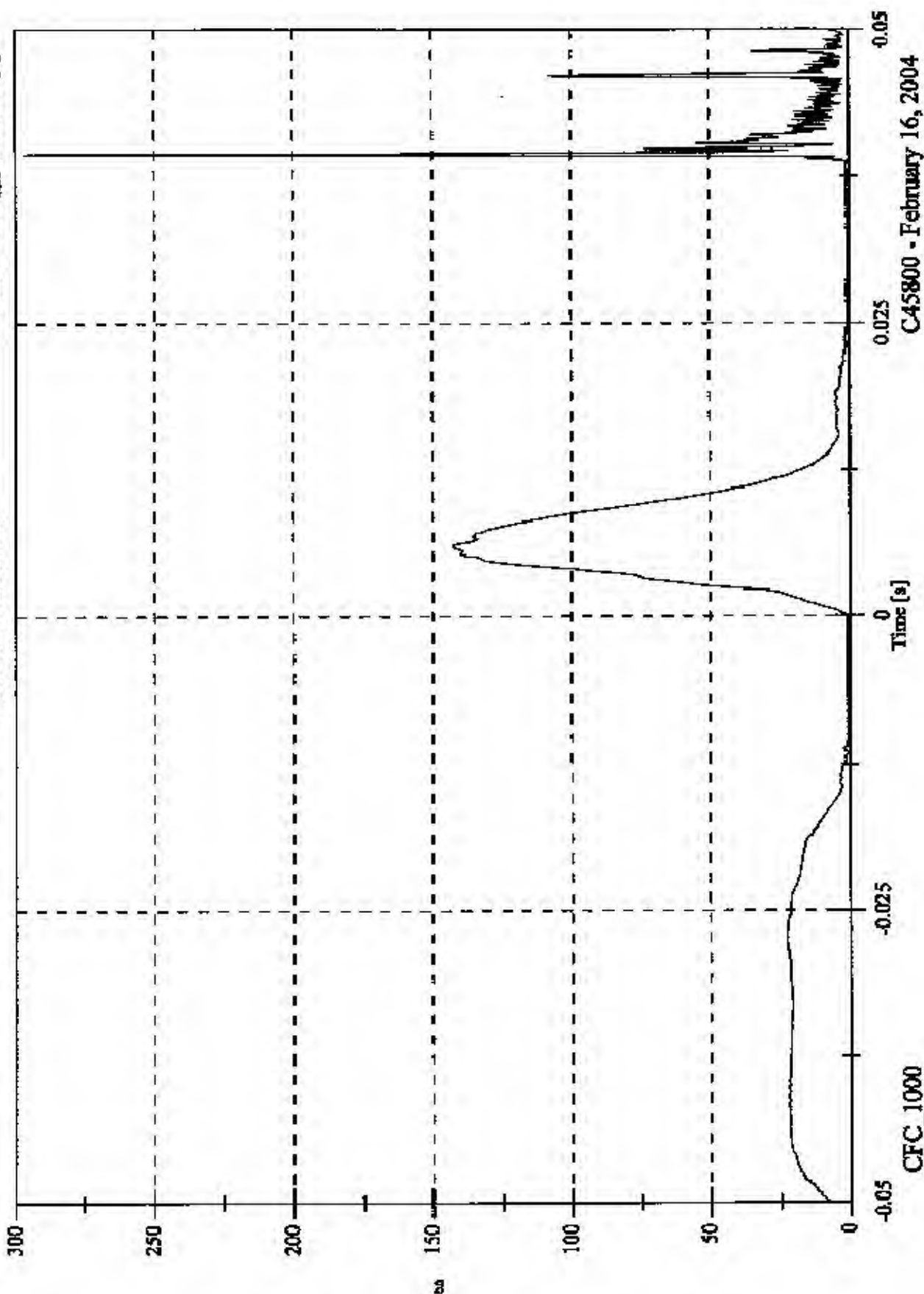


C45800 - February 16, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 297.2 [g] at 0.039 [s]  
Min: 0.4 [g] at 0.030 [s]

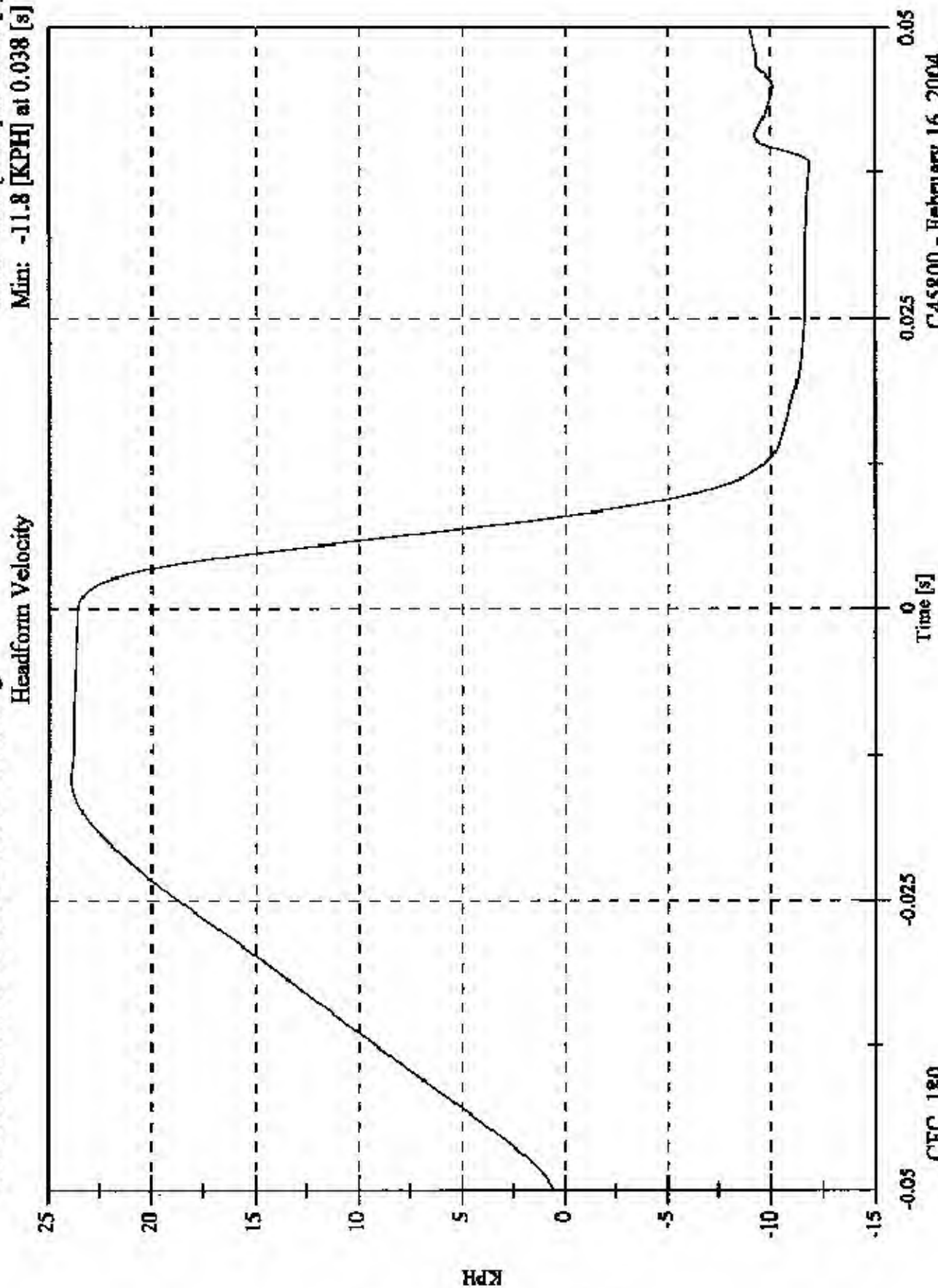


C45800 Driver Side URB Impact Plot #4



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Max: 23.9 [KPH] at -0.015 [s]  
Min: -11.8 [KPH] at 0.038 [s]



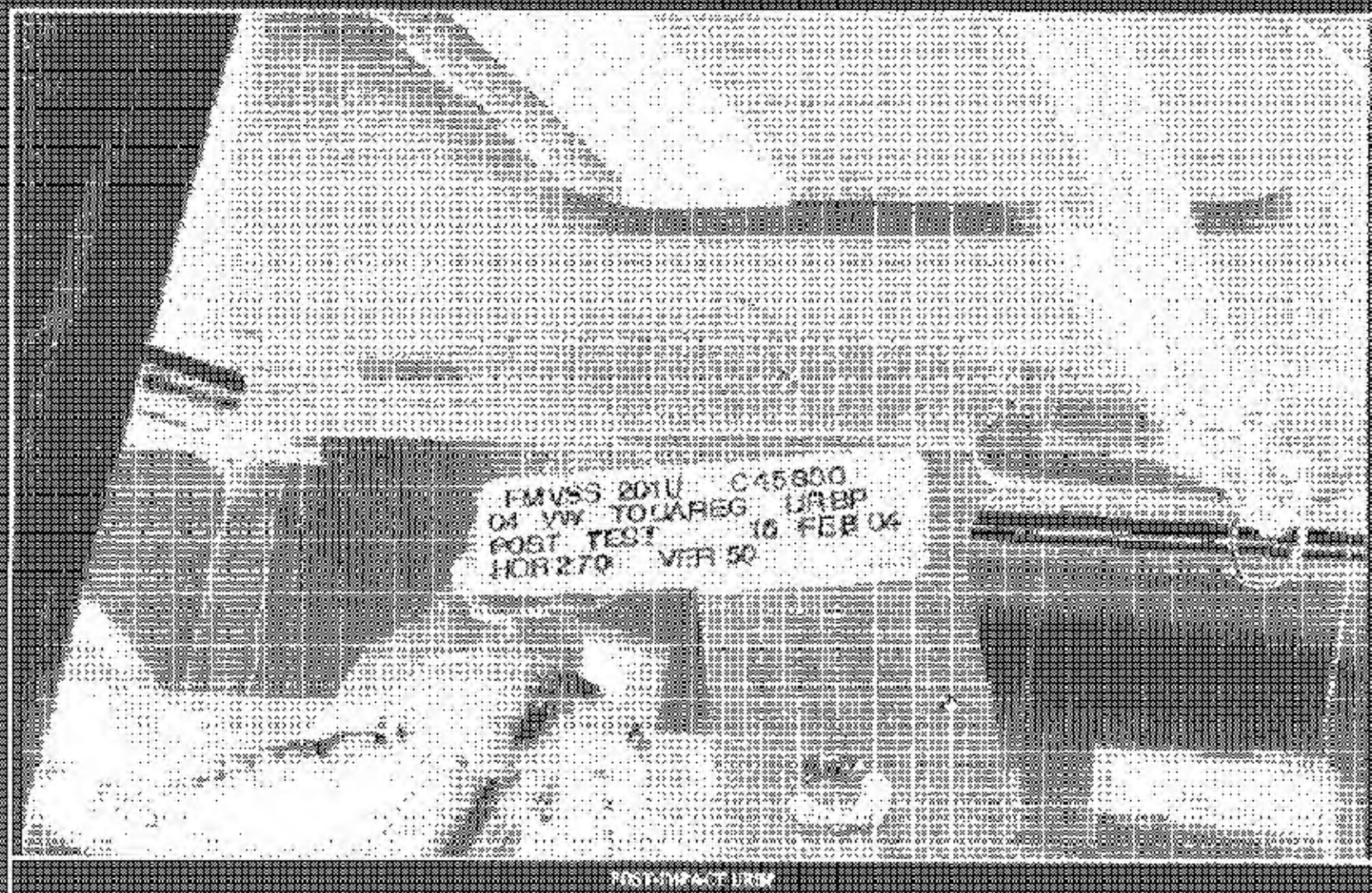
C45800 Driver Side URBP Impact Plot #5

FM VSS 201U C48600  
04 VW TOWAREG URP  
PRE TEST 18 FEB 04  
NOR 270 VER 50

ENDIMPACT NEW

6210-01



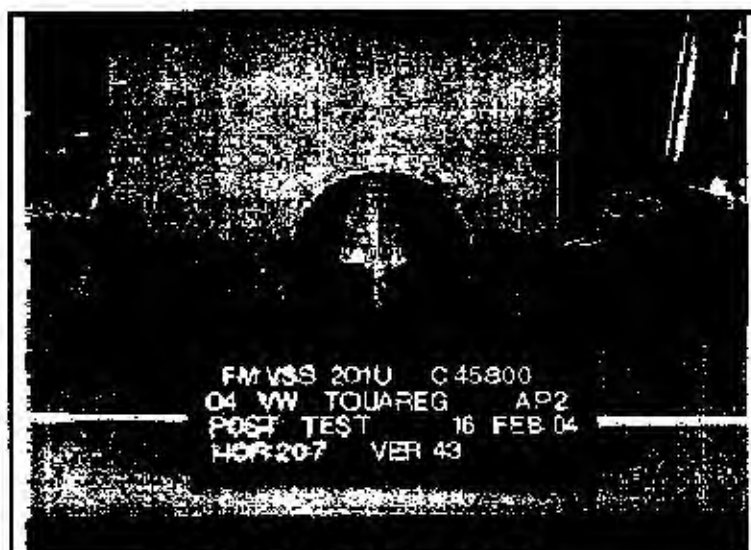


POST-IMPACT VIEW

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Volkswagen Touareg
VIN:	WVGBC67L64D003224
DATE OF MANUFACTURE:	05/03 (SEE CERTIFICATION LABEL)
COLOR:	Wheat Beige

Test Number:	10
Test Date:	February 16, 2004
Target Location:	A-Pillar
Target Code:	AP2
Horizontal Impact Angle:	207°
Vertical Impact Angle:	43°
Ambient Temperature:	21°C
Relative Humidity:	14%
Time of Impact:	13:15
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	9	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	12	mm up	



POST-IMPACT AP2 HEADFORM

Free Motion HIC	526.2
HIC(d)	563.4
Impact Velocity (kph)	18.65
HIC T1 (msec)	1.4
HIC T2 (msec)	6.9



# FMVSS 201U IMPACT TEST - 2004 VW Touareg C45800 - AP2

FMH Headform 0062

Location: AP2

Test Date: February 16, 2004

Work File: AP2

## TEST RESULTS

Lab Temperature: 21 C

HICd: 563.4

Lab Humidity: 14 %

HIC (36ms): 526.2

Velocity at Impact: 18.65 KPH

t1: 1.5 msec

t2: 6.9 msec

Free Flight Distance: 218.05 mm

Duration: 5.5 msec

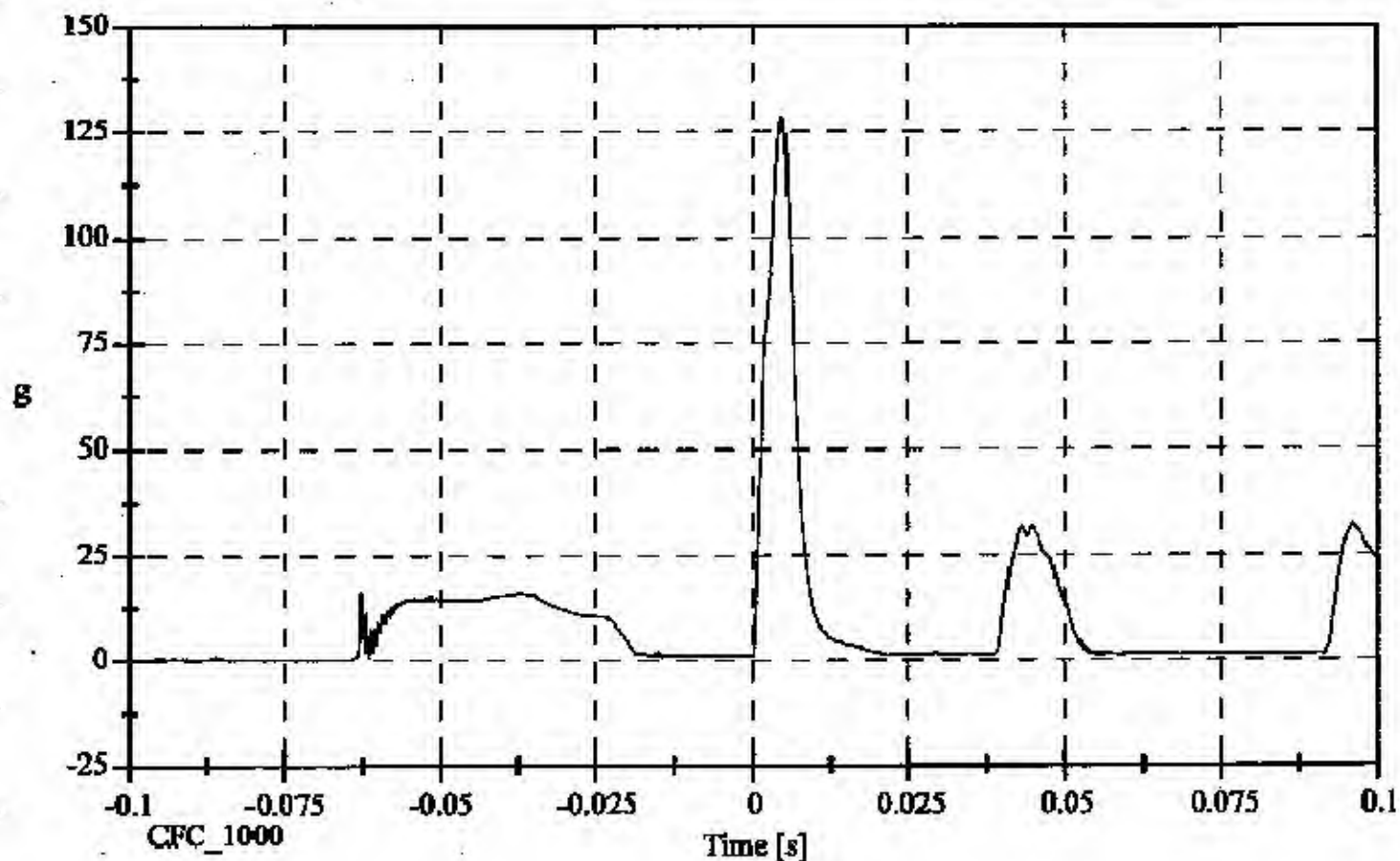
Average Acceleration: 9.1 g

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 128.3 [g] at 0.005 [s]

Min: -0.0 [g] at -0.100 [s]

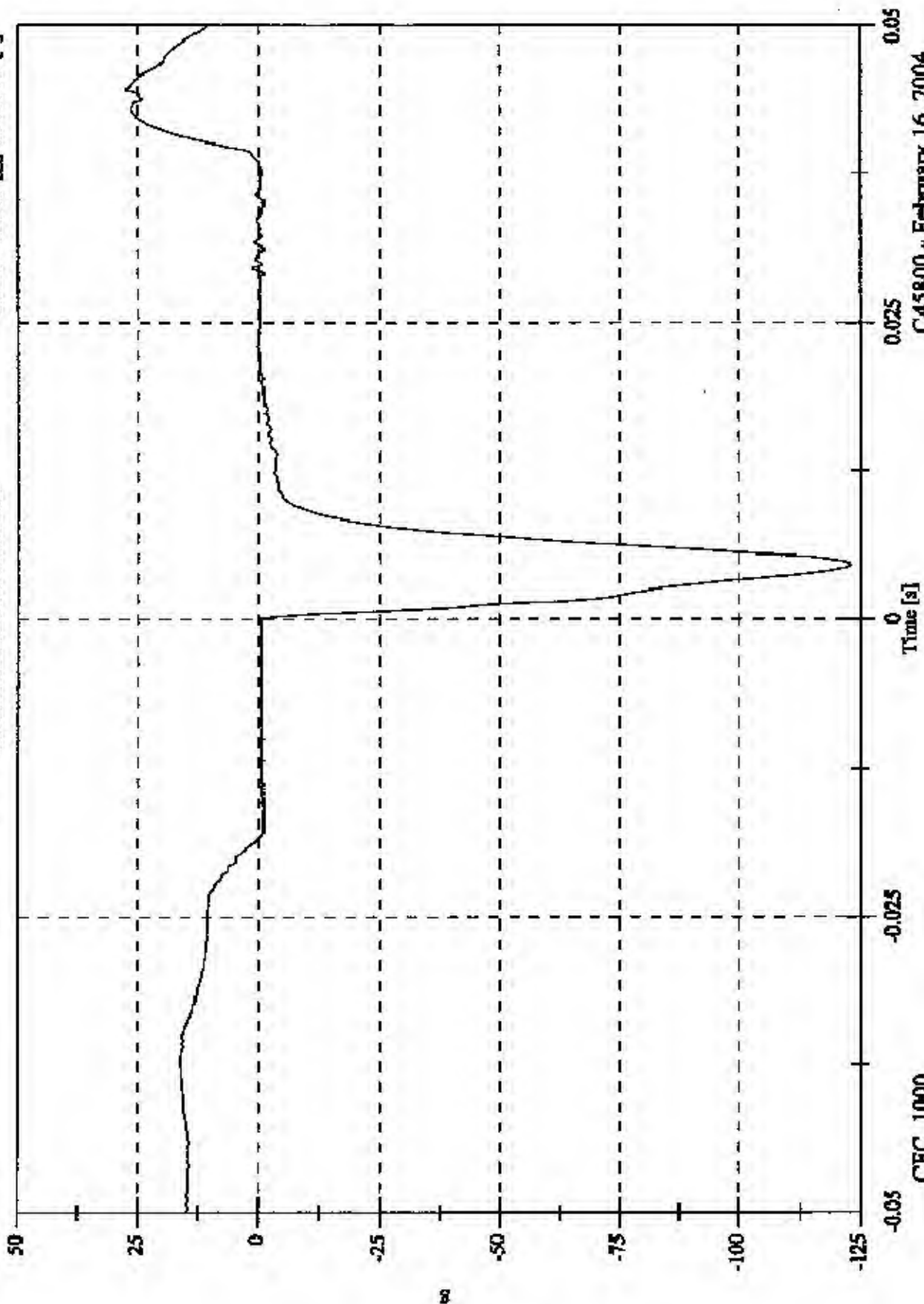


FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform X Acceleration

Max: 27.5 [g] at 0.045 [s]

Min: -123.1 [g] at 0.005 [s]



CFC\_1000

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

-0.025

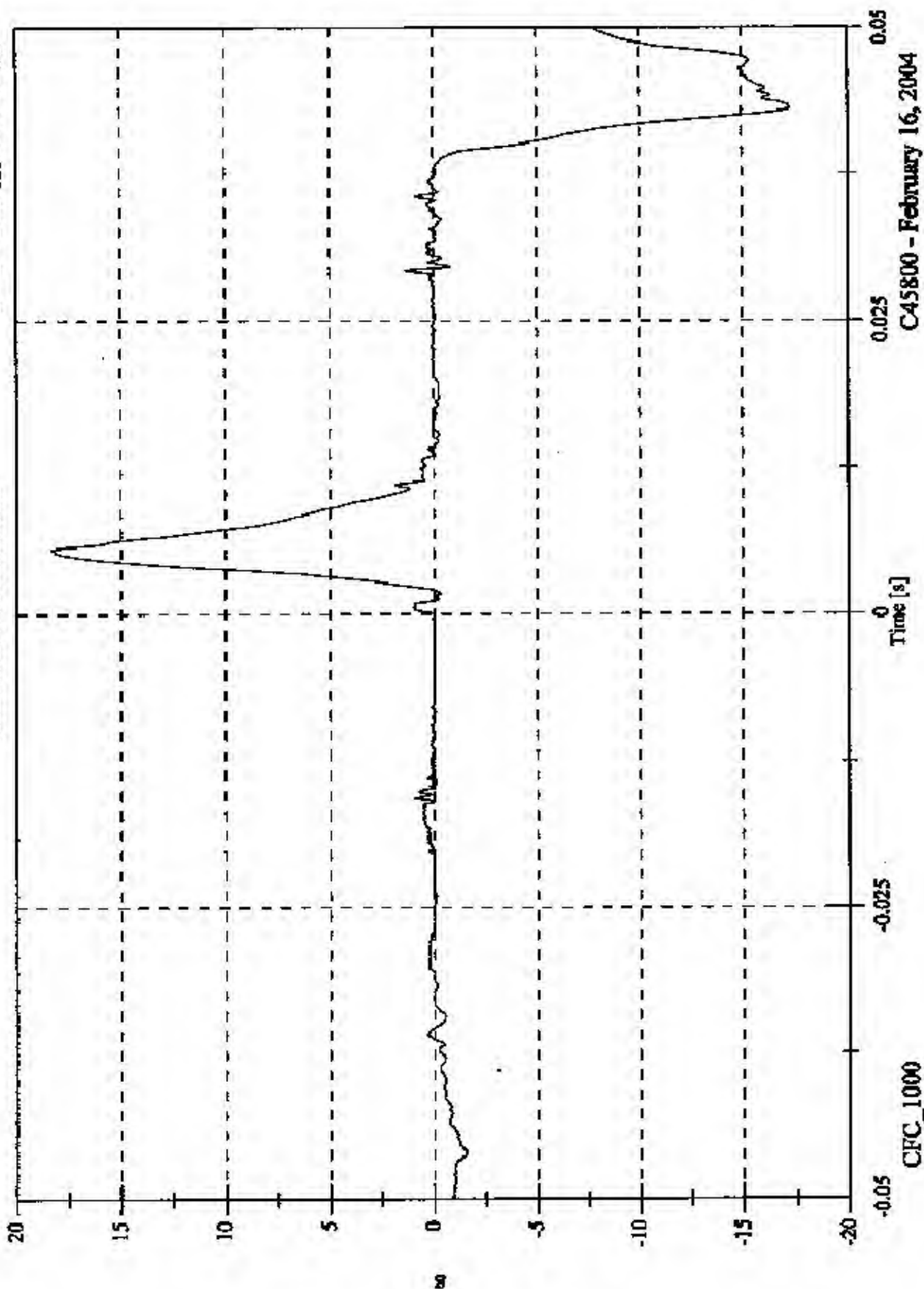
-0.025

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Y Acceleration

Max: 18.3 [g] at 0.005 [s]

Min: -17.2 [g] at 0.043 [s]

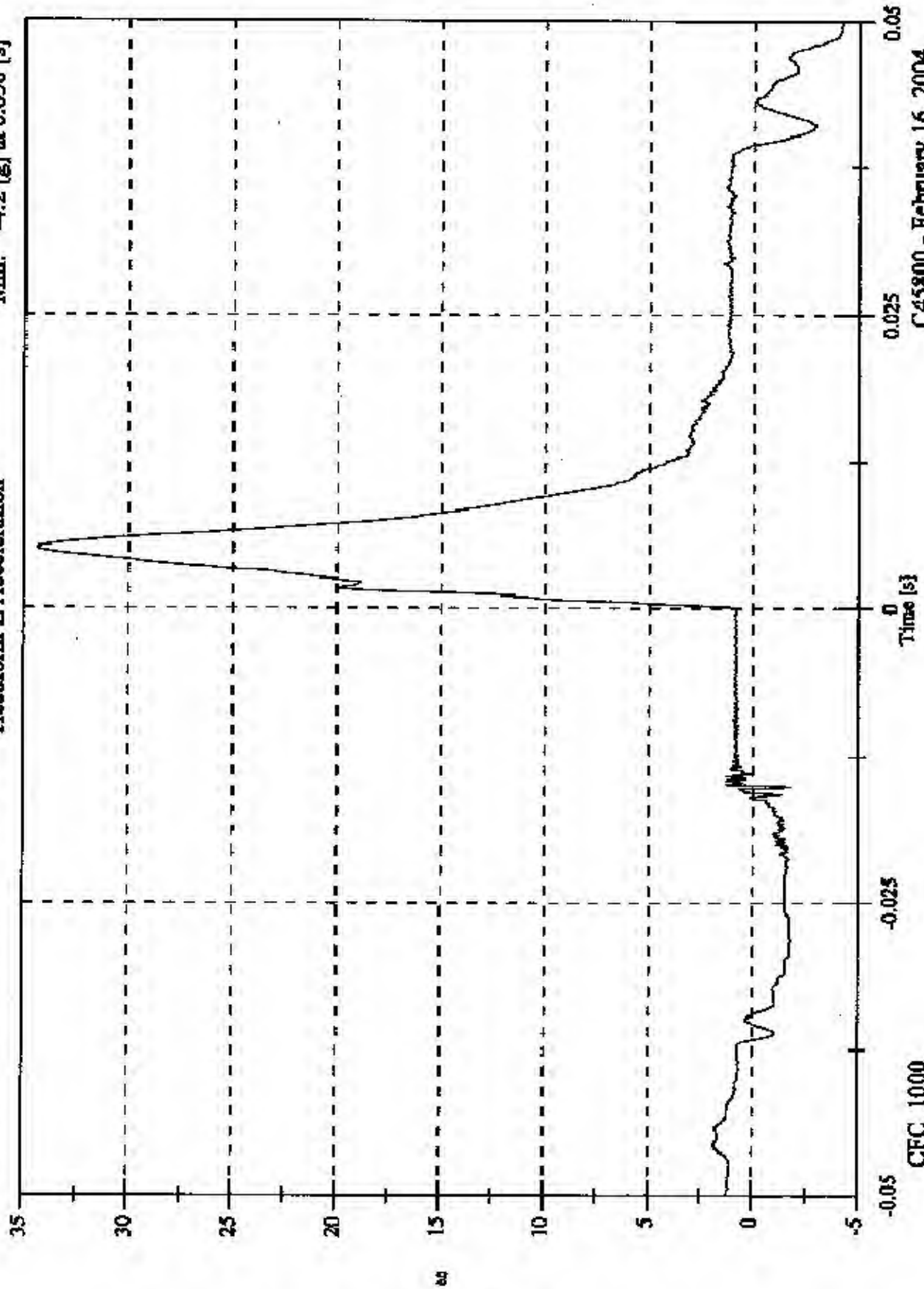


C45800 - February 16, 2004

FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Z Acceleration

Max: 34.4 [g] at 0.005 [s]  
Min: -4.2 [g] at 0.050 [s]



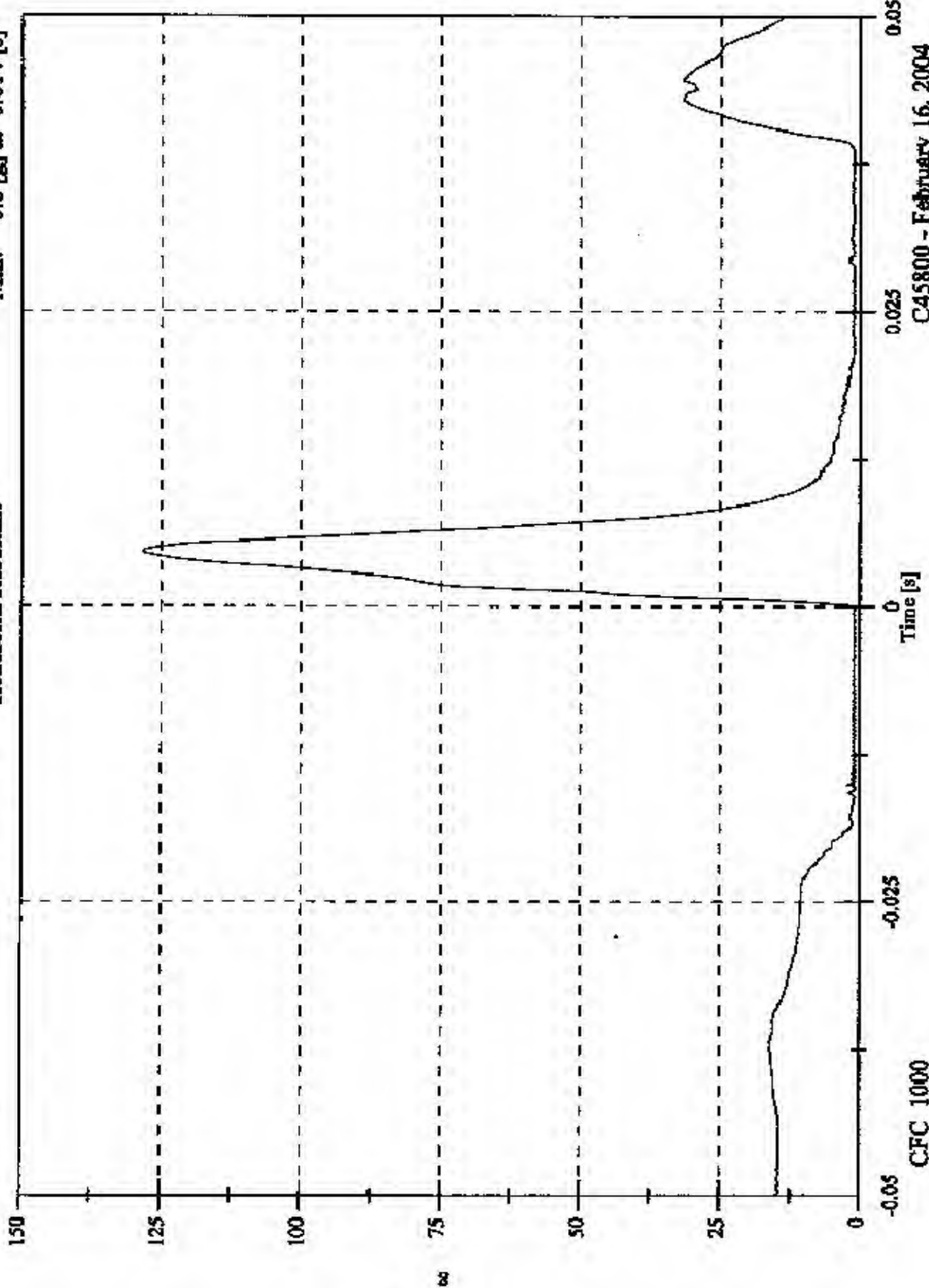
C45800 - February 16, 2004



FMVSS 201U IMPACT TEST - 2004 VW Touareg

Headform Resultant

Max: 128.3 [g] at 0.005 [s]  
Min: 0.6 [g] at -0.014 [s]



CFC\_1000

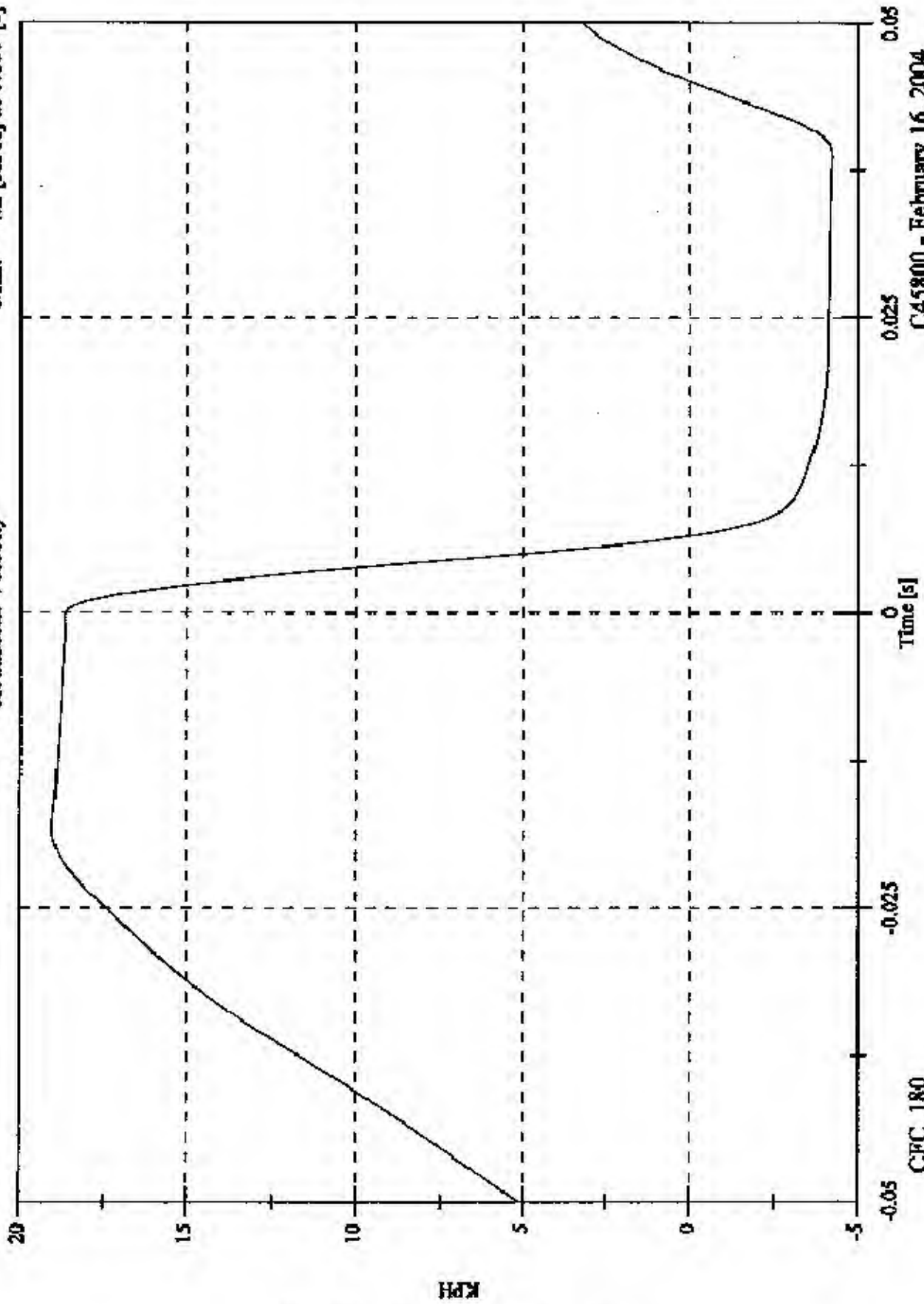
C45800 - February 16, 2004

C45800 Driver Side AP2 Impact Plot #4

FMVSS 201U IMPACT TEST - 2004 VW Touareg

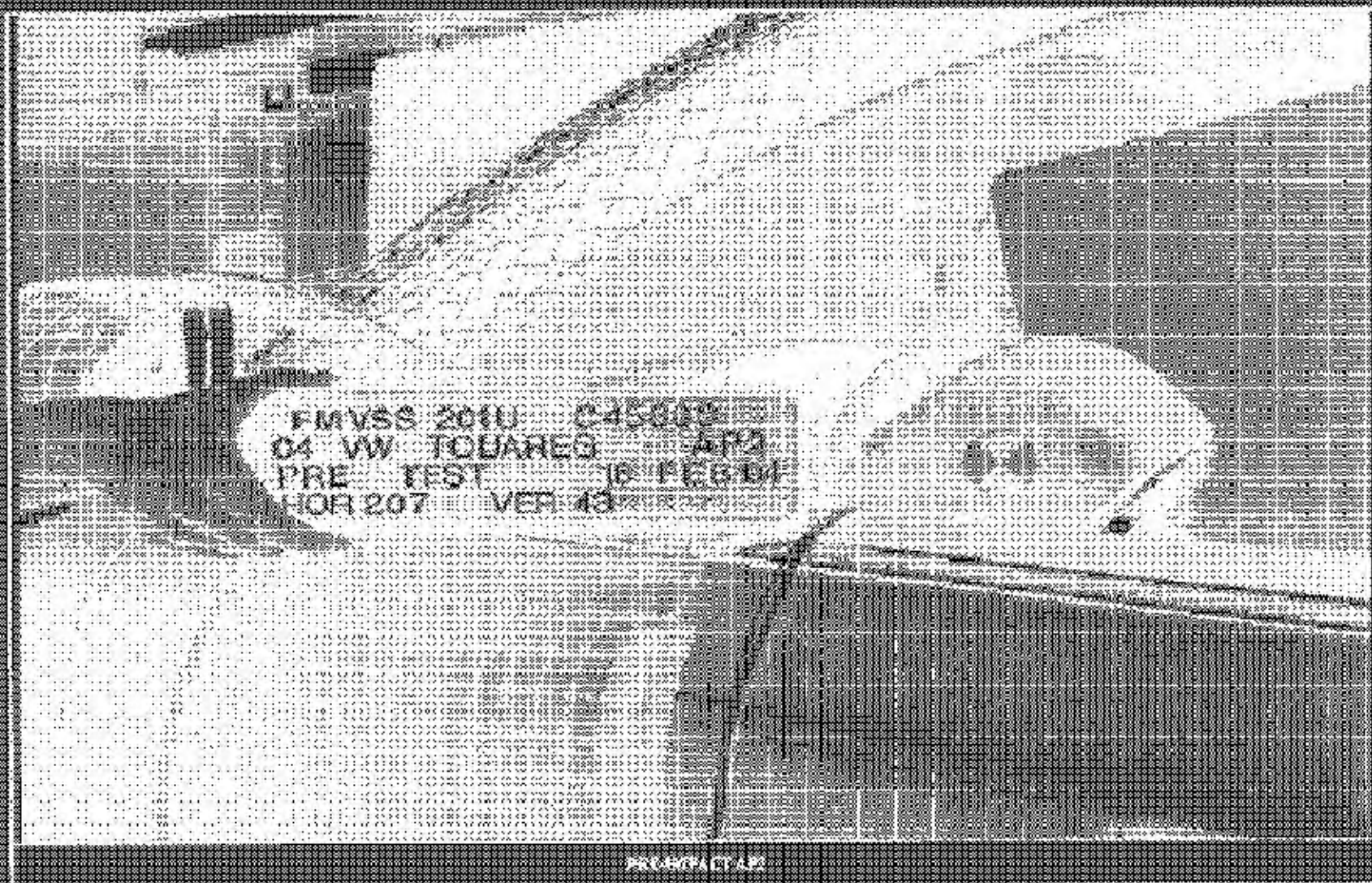
Max: 19.1 [KPH] at -0.018 [s]  
Min: -4.2 [KPH] at 0.039 [s]

Headform Velocity



CFC\_180

C45800 - February 16, 2004

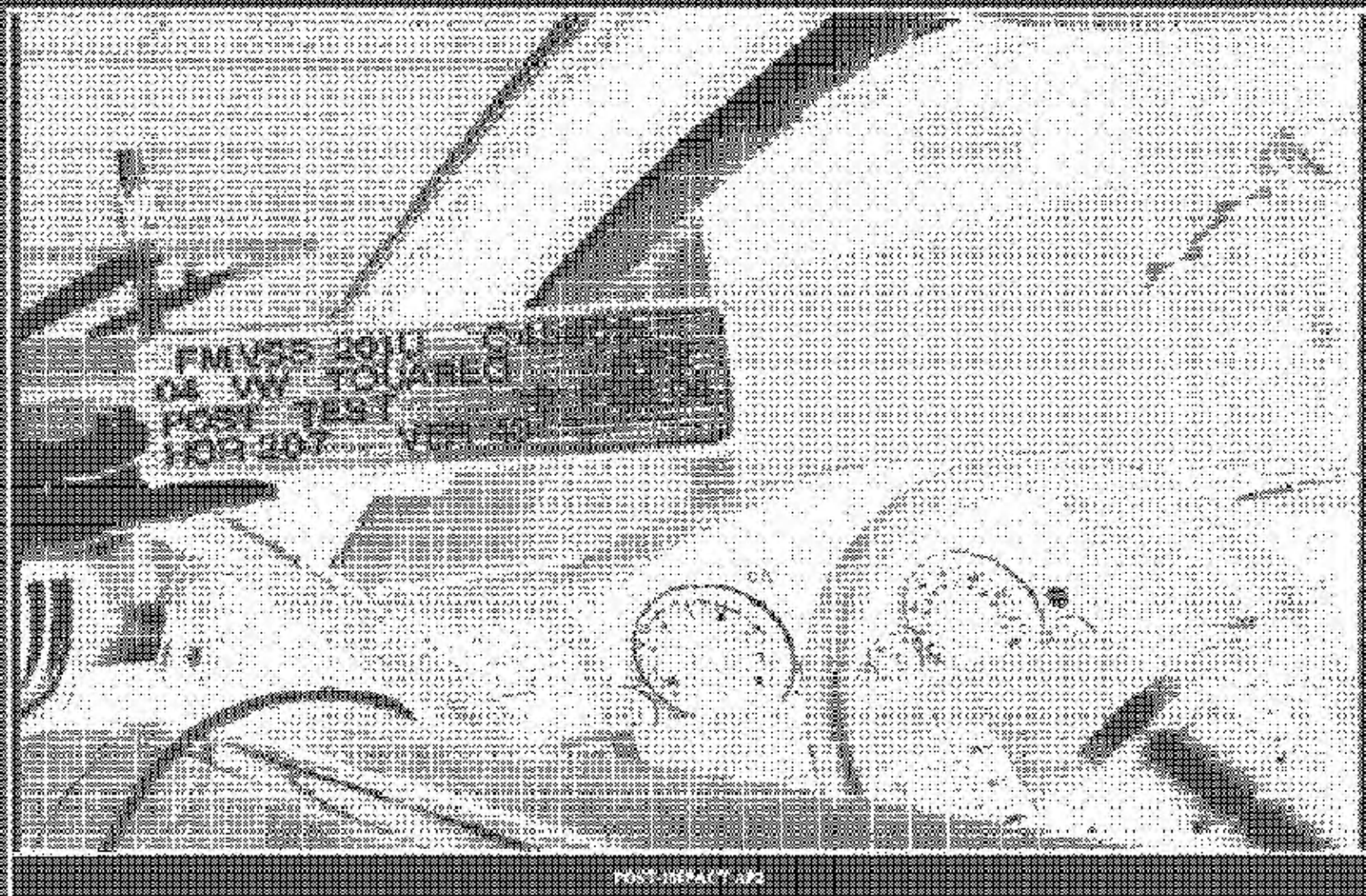


FMVSS 2010 C-45012  
04 VW TOBAREG AP2  
PRE TEST 10 FEB 01  
HOR 207 VER 43

PROHIBITED

5700-01





70-01



**APPENDIX A**  
**PHOTOGRAPHS**

### PHOTOGRAPHS

FIGURE	VIEW
A-1	LEFT SIDE VIEW OF VEHICLE
A-2	RIGHT SIDE VIEW OF VEHICLE
A-3	3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
A-4	3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE
A-5	VEHICLE'S CERTIFICATION LABEL
A-6	VEHICLE'S TIRE INFORMATION LABEL
A-7	PRE-TEST DRIVER SIDE A-PILLAR
A-8	PRE-TEST DRIVER SIDE FRONT HEADER
A-9	PRE-TEST DRIVER SIDE SIDE RAIL
A-10	PRE-TEST DRIVER SIDE B-PILLAR
A-11	PRE-TEST DRIVER SIDE OTHER PILLAR
A-12	PRE-TEST PASSENGER SIDE A-PILLAR
A-13	PRE-TEST PASSENGER SIDE FRONT HEADER
A-14	PRE-TEST PASSENGER SIDE SIDE RAIL
A-15	PRE-TEST PASSENGER SIDE B-PILLAR
A-16	PRE-TEST PASSENGER SIDE OTHER PILLAR
A-17	POST-TEST DRIVER SIDE A-PILLAR
A-18	POST-TEST DRIVER FRONT HEADER
A-19	POST-TEST DRIVER SIDE SIDE RAIL
A-20	POST-TEST DRIVER SIDE B-PILLAR
A-21	POST-TEST DRIVER SIDE OTHER PILLAR
A-22	POST-TEST PASSENGER SIDE A-PILLAR
A-23	POST-TEST PASSENGER FRONT HEADER
A-24	POST-TEST PASSENGER SIDE SIDE RAIL
A-25	POST-TEST PASSENGER SIDE B-PILLAR
A-26	POST-TEST PASSENGER SIDE OTHER PILLAR

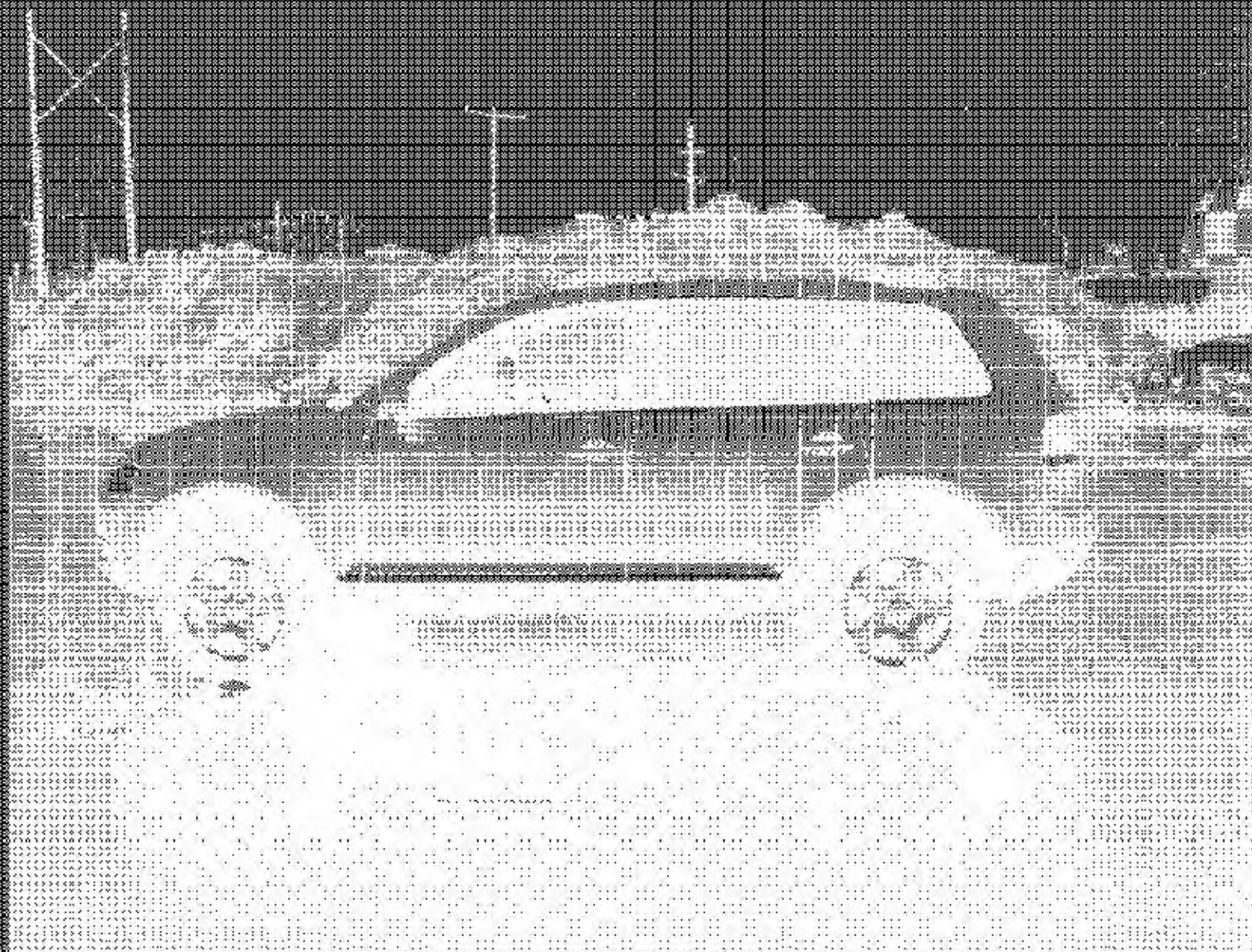


Figure A-1 LEFT SIDE VIEW OF VERTCL





FIGURE A-2. RIGHT SIDE VIEW OF VEHICLE





FIGURE 1. 3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE





Figure A-4. 3/4 REAR VIEW FROM NORTH SIDE OF VIEW C-1.

MFD BY VOLKSWAGEN AG GERMANY 05/03 37  
GVWR 6493 GAWR FRONT 3119 / REAR 3549 LBS  
THIS VEHICLE CONFORMS TO ALL APPLICABLE  
U.S. FEDERAL MOTOR VEHICLE SAFETY AND  
THEFT PREVENTION STANDARDS IN EFFECT ON  
THE DATE OF MANUFACTURE SHOWN ABOVE.  
WVGBC67L64D003224 TYPE: MPV 506156 2003



Figure A-5 : VEHICLE'S CERTIFICATION LABEL

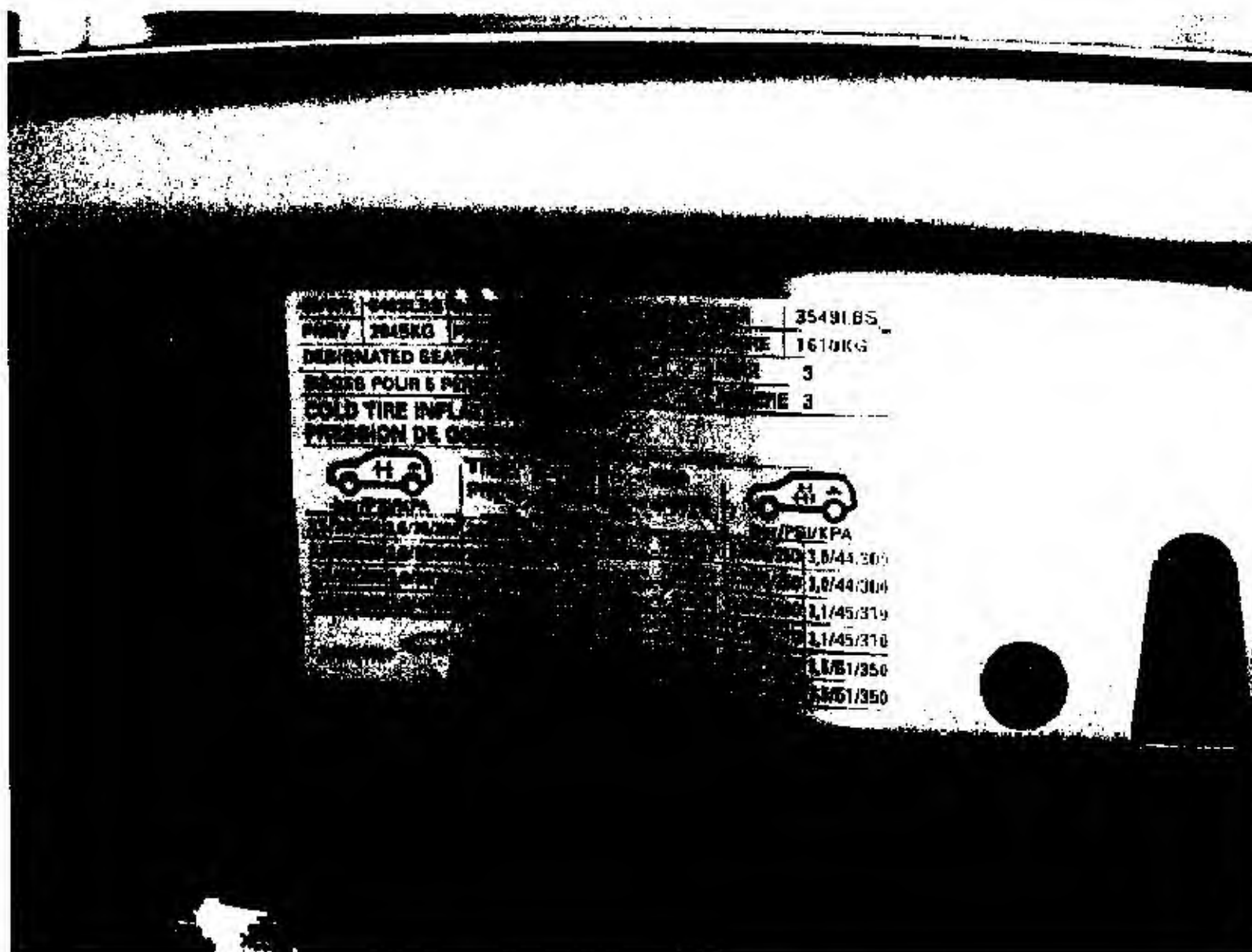


Figure A-6 : VEHICLE'S TIRE INFORMATION LABEL



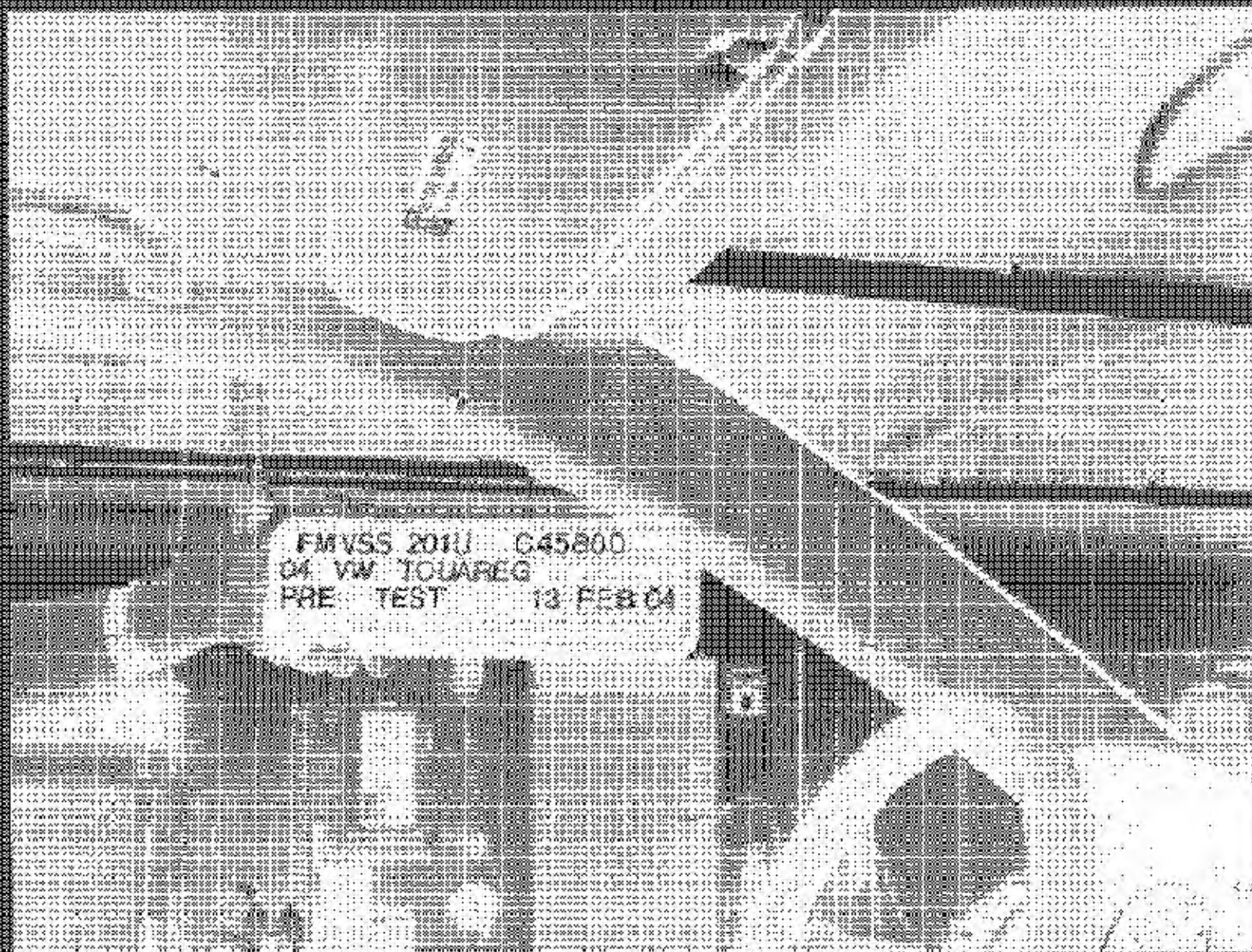


Figure A-7. PRE TEST DRIVER SIDE A-PILLAR





FIGURE 1-3 PRE-TEST DRIVER SIDE FRONT HEADLAMP





Figure A-9. PRE TEST DRIVER SIDE SHAG RAIL





Figure A-10 PRE-TEST DRIVER SIDE B-PILLAR



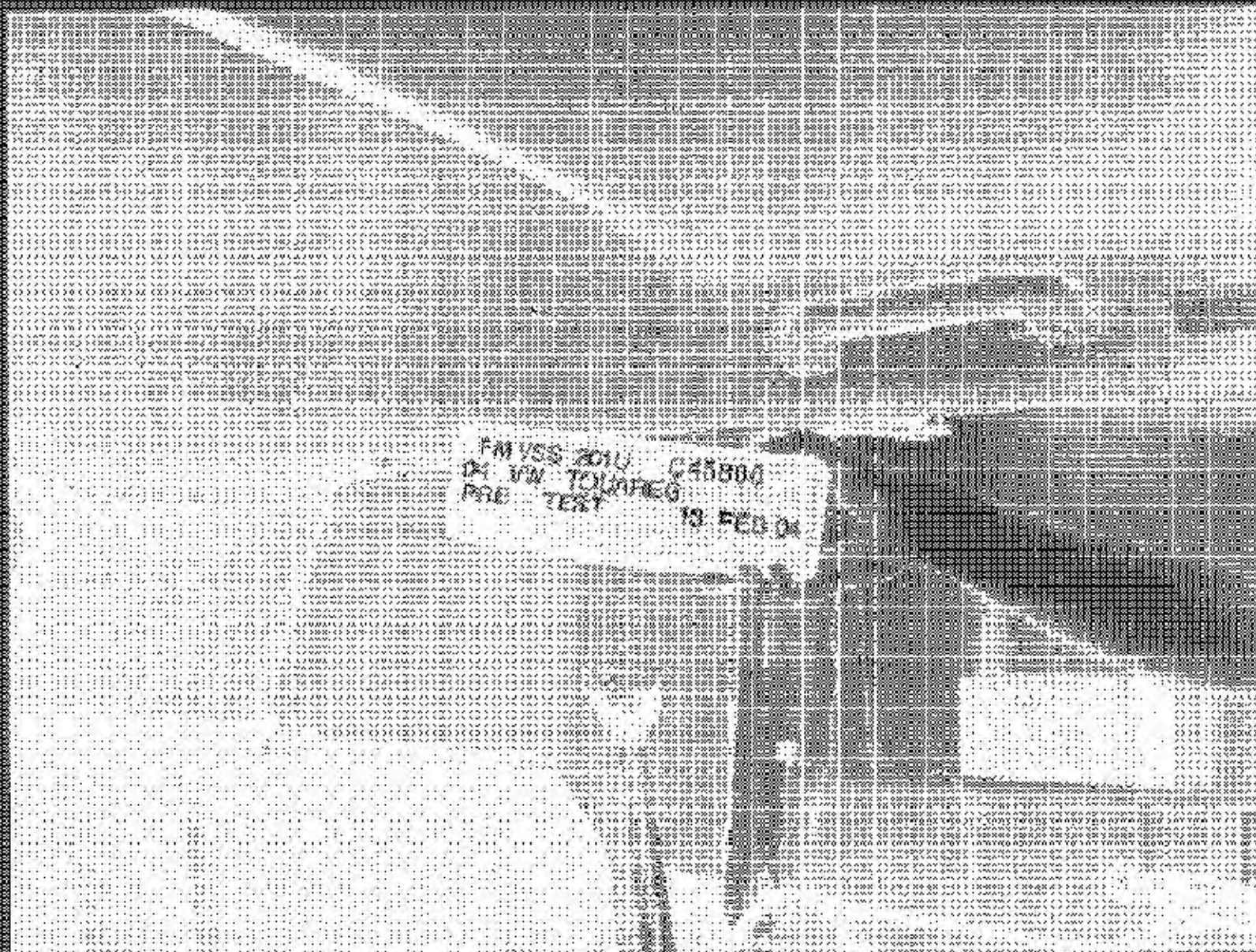


Figure A-11 PRE-TEST DRIVER SIDE OTHER MILLAN



EMISS 2010 040856  
04 PW TO JARED  
PRE TEST  
1 FEB 04

FIGURE 12 PRE-TEST PASSENGER SIDE A-PILLAR



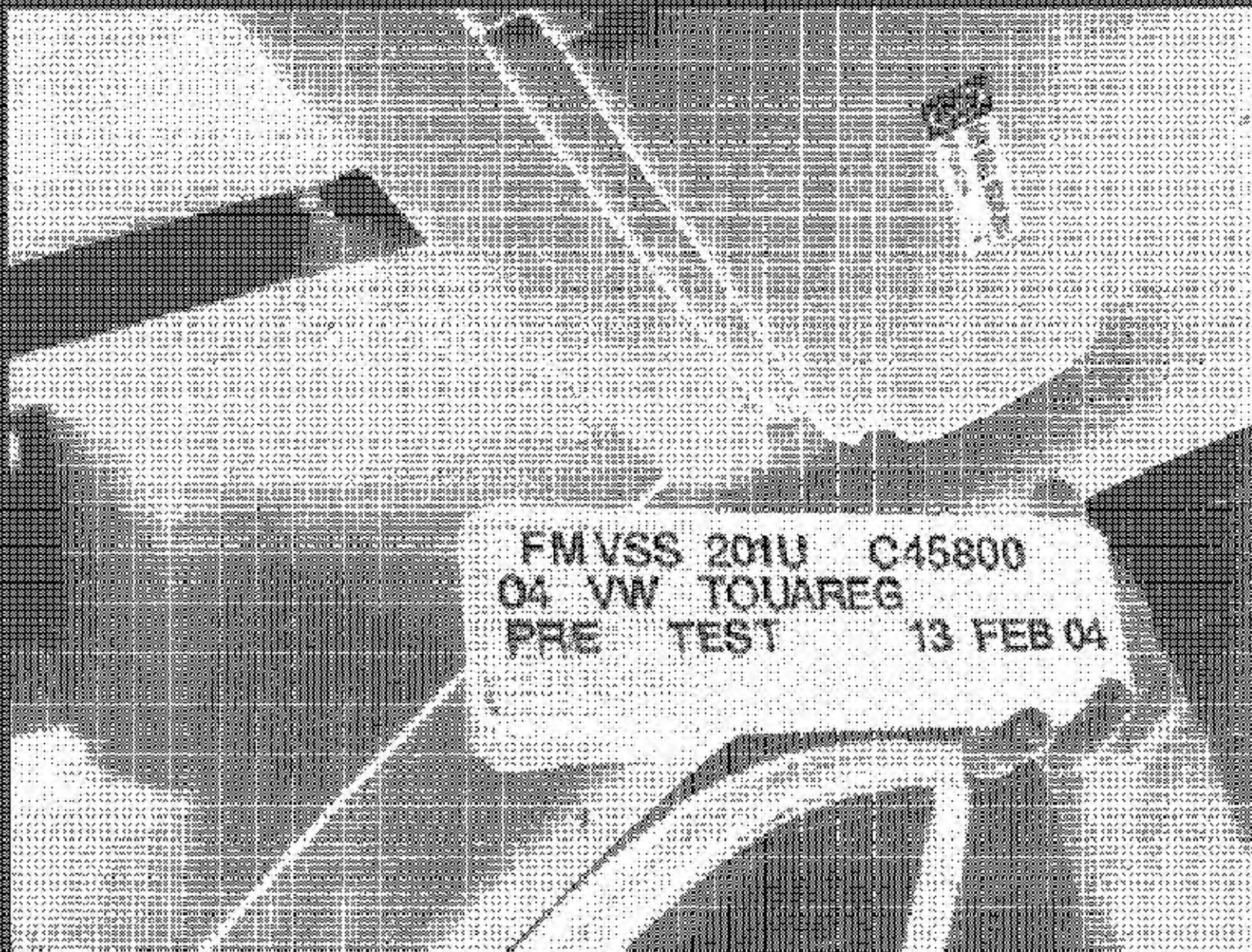


Figure A-13: PRE-TEST PASSENGER SIDE FRONT HEADER



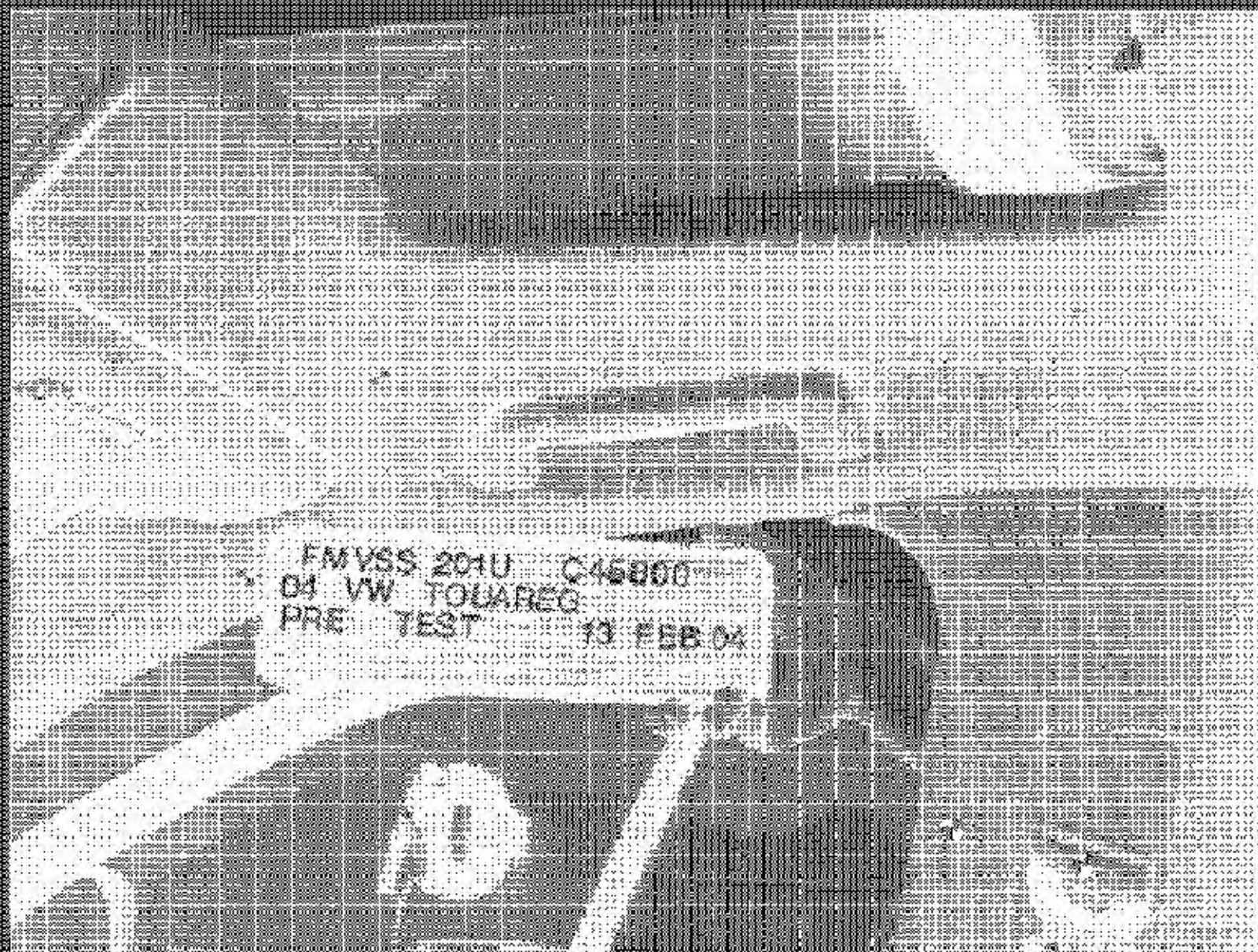


Figure A-24 PRE-TEST PASSENGER SIDE SIDE RAIL





Figure A-15 PRE TEST PASSENGER SIDE B-POLAR



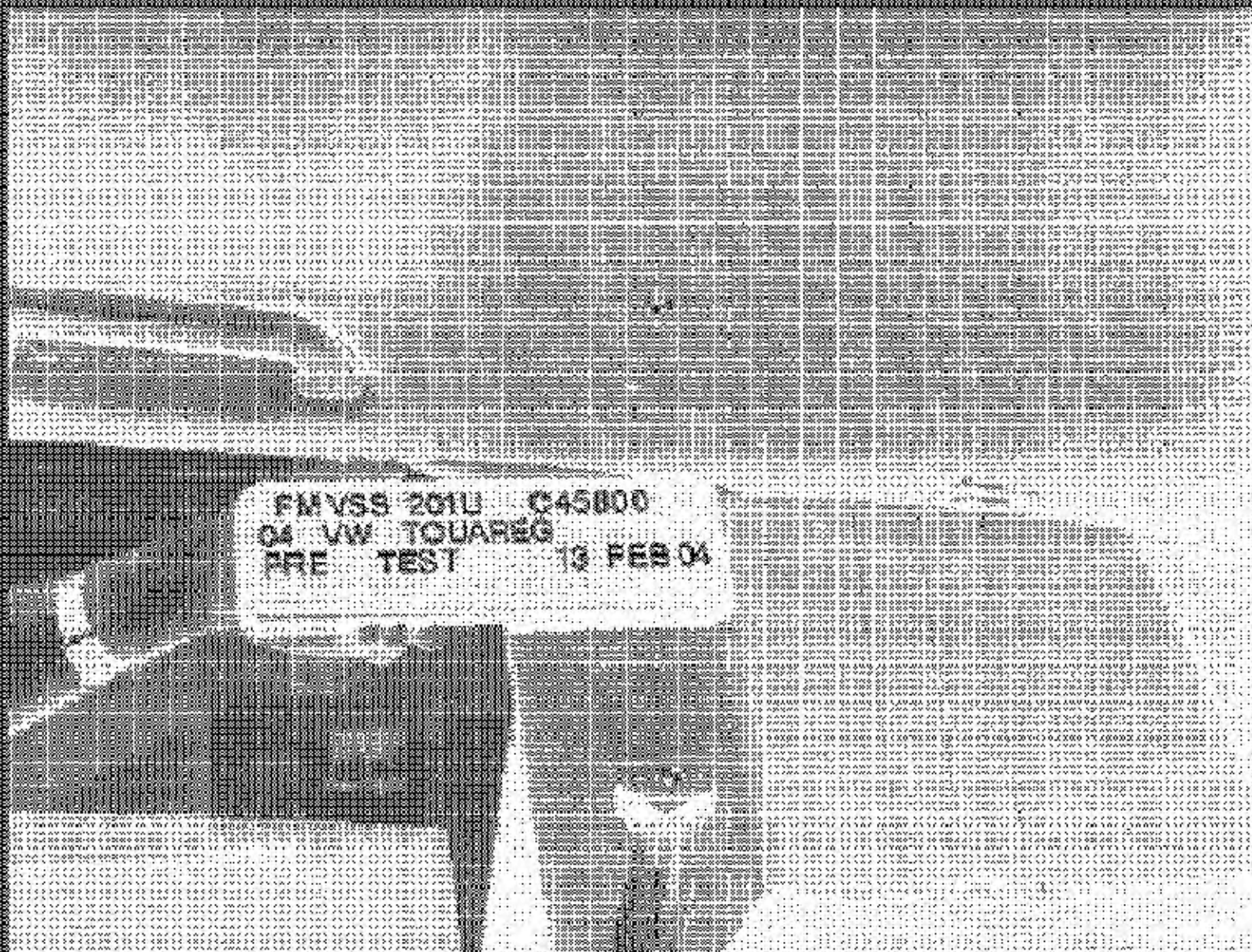


Figure A-16. PRE-TEST-PASSENGER-SIDE OTHER PILLAR



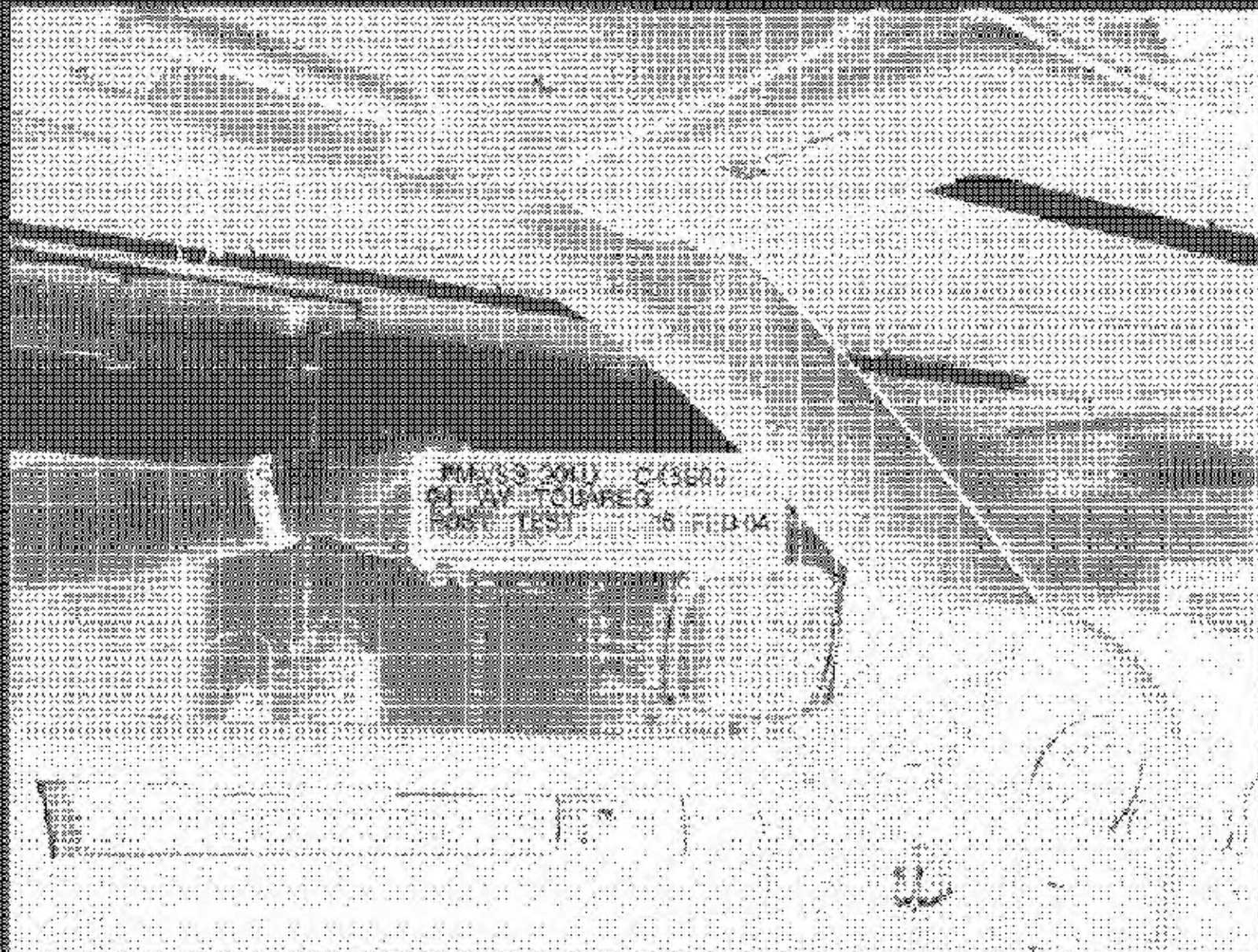


Figure A-17 POST-TEST DRIVER SIDE A-PILLAR



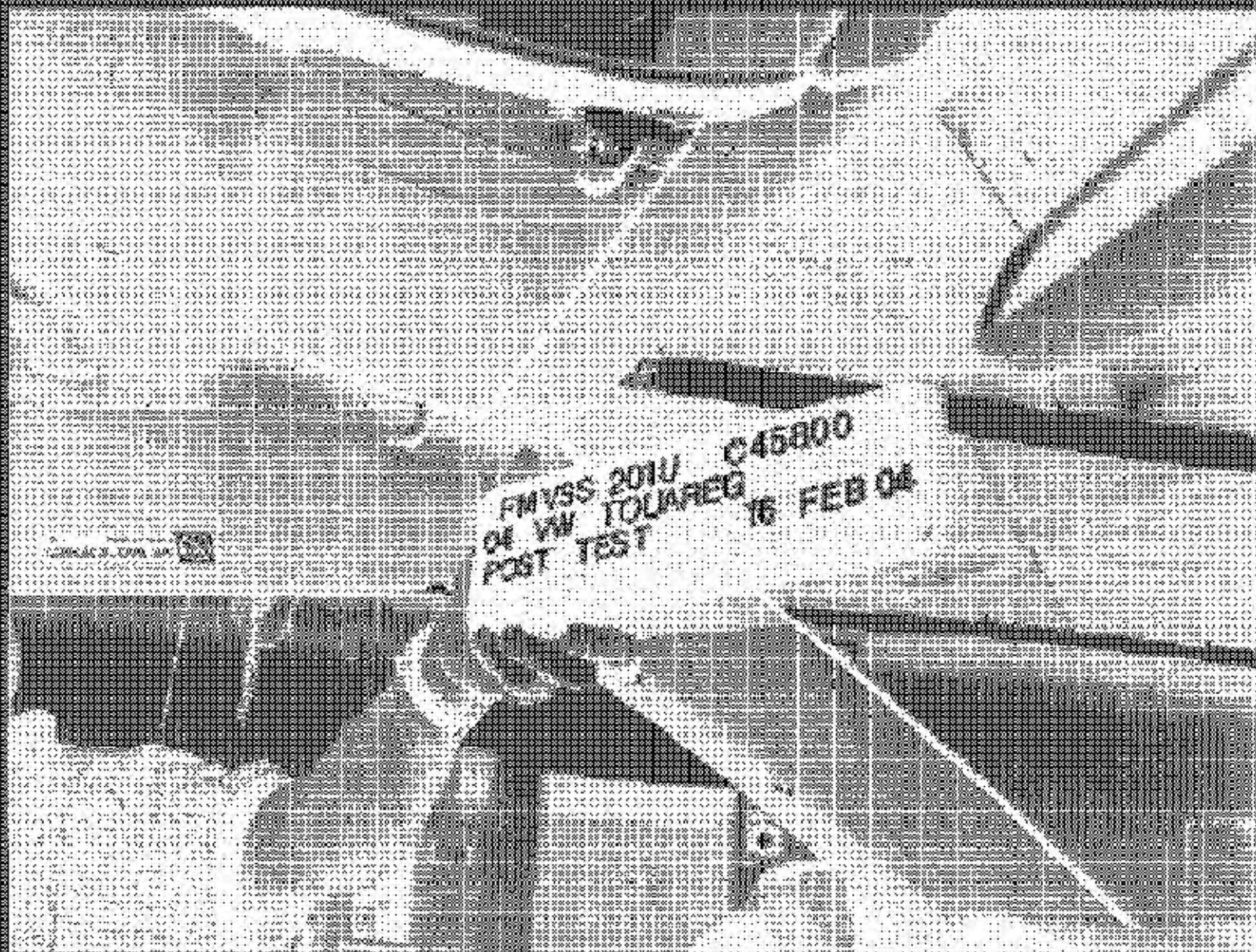


Figure A-46 POST-TEST DRIVER SIDE FRONT HEADER





Figure A-19 POST-TEST DRIVER SIDE SIDE RAIL





Figure A-20 POST-TEST DRIVER SIDE B-PILLAR





Figure A-24. POST-TEST DRIVER SIDE OTHER PILLAR



FMVSS 201U C45800  
04 VW TOUAREG  
POST TEST 16 FEB 04

Figure A-22. POST-TEST PASSENGER SIDE A-PILLAR



FMVSS 201U C45800  
04 VW TOUAREG  
POST TEST 16 FEB 04

Figure A-23 POST-TEST PASSENGER SIDE FRONT HEADER



FMVSS 2010 C45800  
QS VW TOLAREG  
POST TEST 16 FEB 04





FIGURE 3-31. POST TEST PASSENGER SIDE B-PILAR





Figure A-26 POST-TEST PASSENGER NDR OTHER PILLAR

## **APPENDIX B**

### **PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT**

Appendix B contains the results from certification tests performed on the Free Motion Headforms utilized in this test program. The results indicate that the headforms meet all of the performance specifications given in 49 CFR Part 572 Subpart L.

The tests were conducted at the Dummy Certification Test Facility of Veridian Engineering. A summary of the test results are included in this Appendix.

**PART 572L  
HEAD DROP PRE-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>
<b>SERIAL NUMBER:</b>		<b>0642</b>
<b>CALIBRATION DATE:</b>		<b>February 11, 2004</b>
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>24</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>18</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>227.8</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>2.6</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>ID. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J24576</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J33038</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J31089</b>	<b>08/22/03</b>	<b>02/23/04</b>

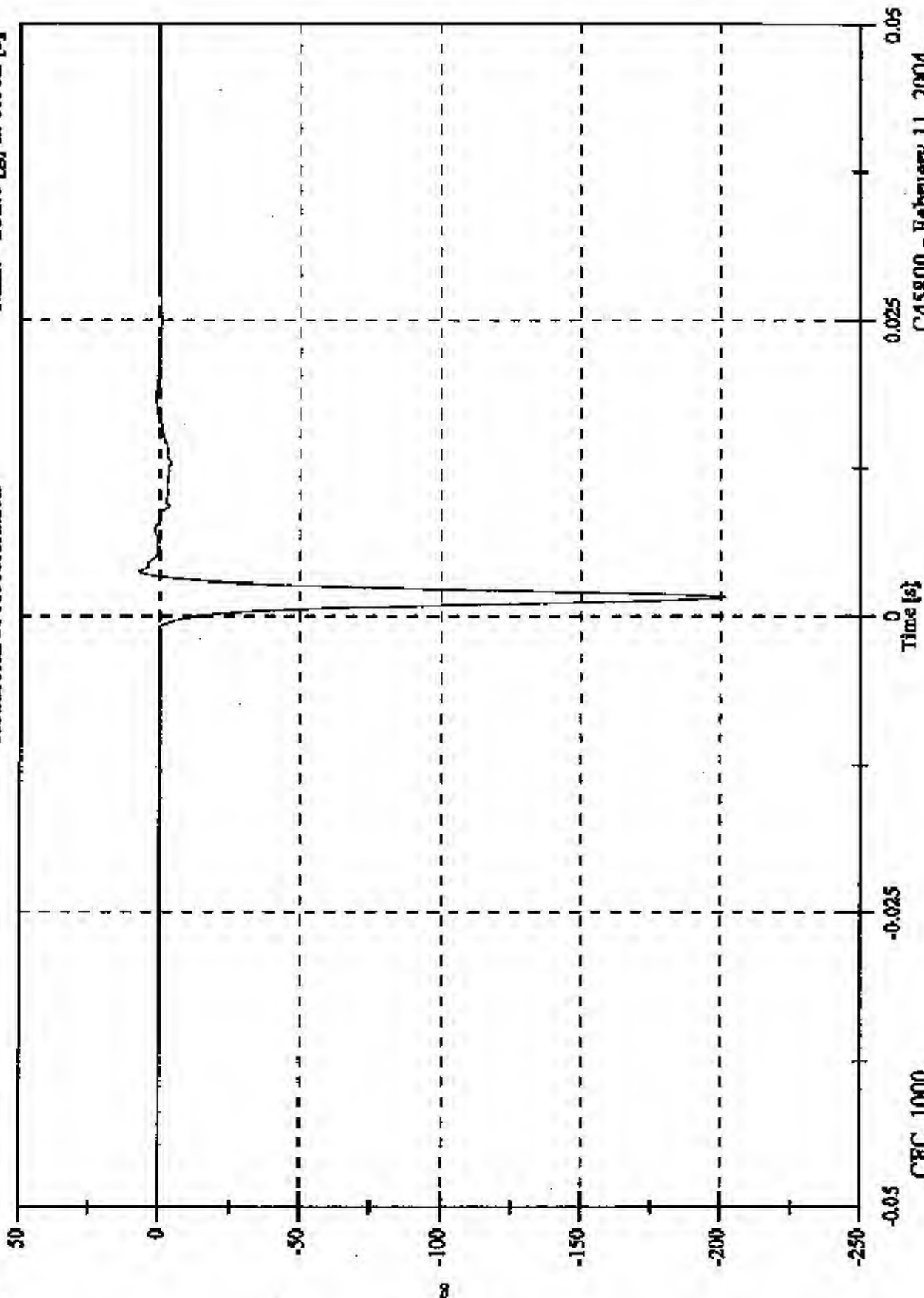
**REMARKS:**



# EMVSS 201U - Headform Calibration Drops

Max: 7.3 [g] at 0.004 [s]  
Min: -202.0 [g] at 0.002 [s]

Headform X Acceleration

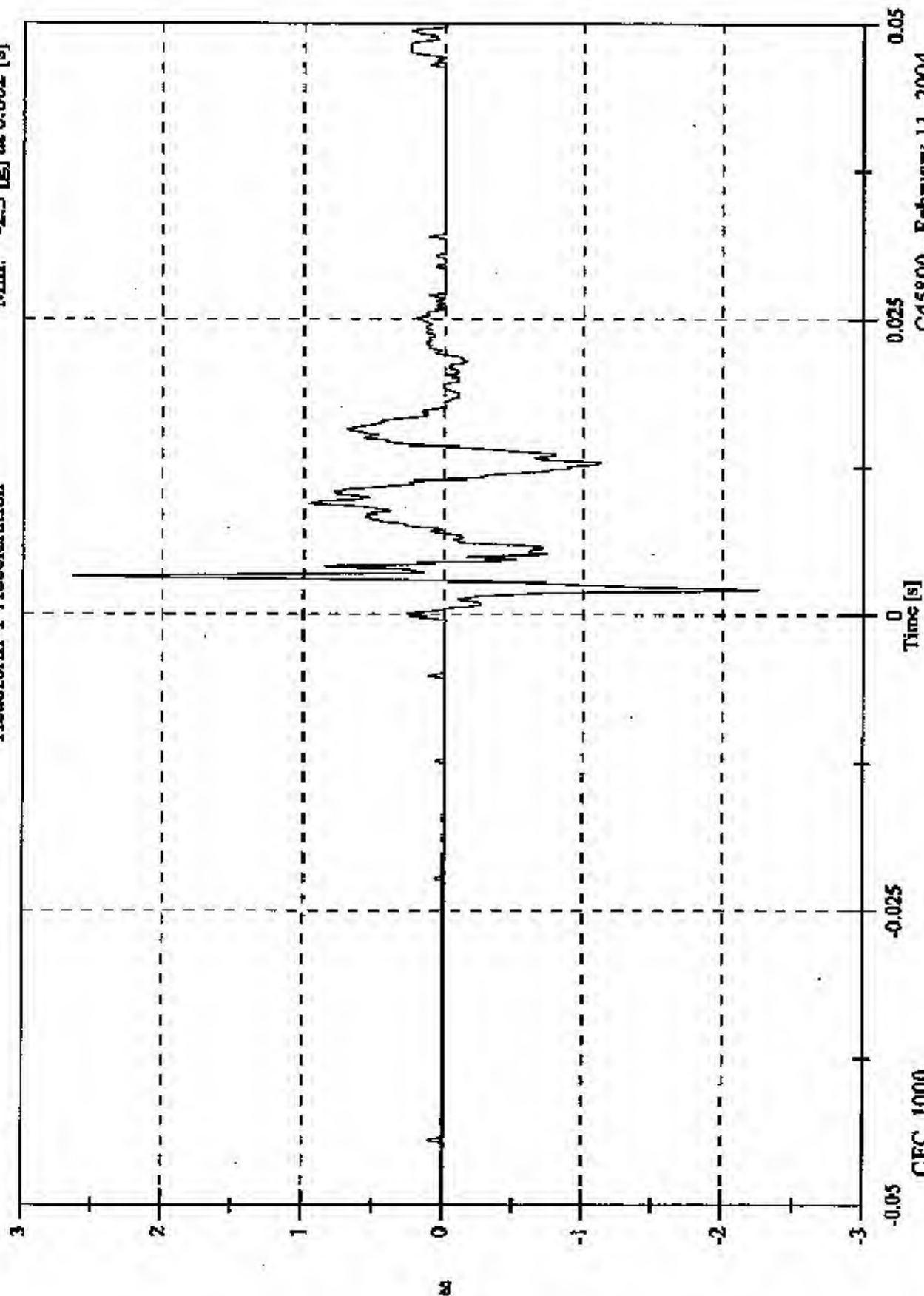


C45800 - February 11, 2004

# FMVSS 201U - Headform Calibration Drops

Max: 2.6 [g] at 0.003 [s]  
Min: -2.3 [g] at 0.002 [s]

Headform Y Acceleration

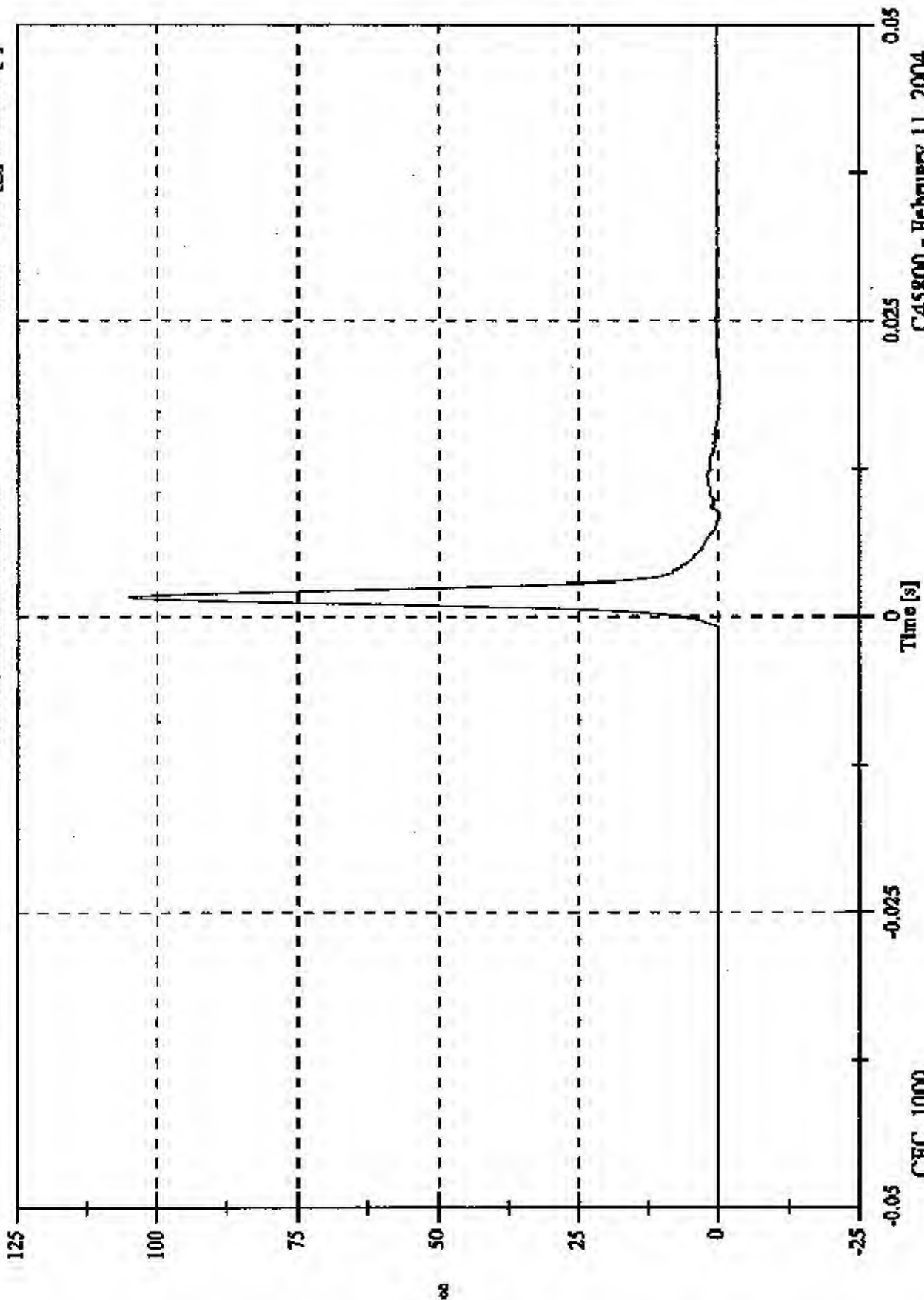


C45800 - February 11, 2004

# FMVSS 201U - Headform Calibration Drops

Max: 105.4 [g] at 0.002 [s]  
Min: -0.3 [g] at 0.018 [s]

Headform Z Acceleration



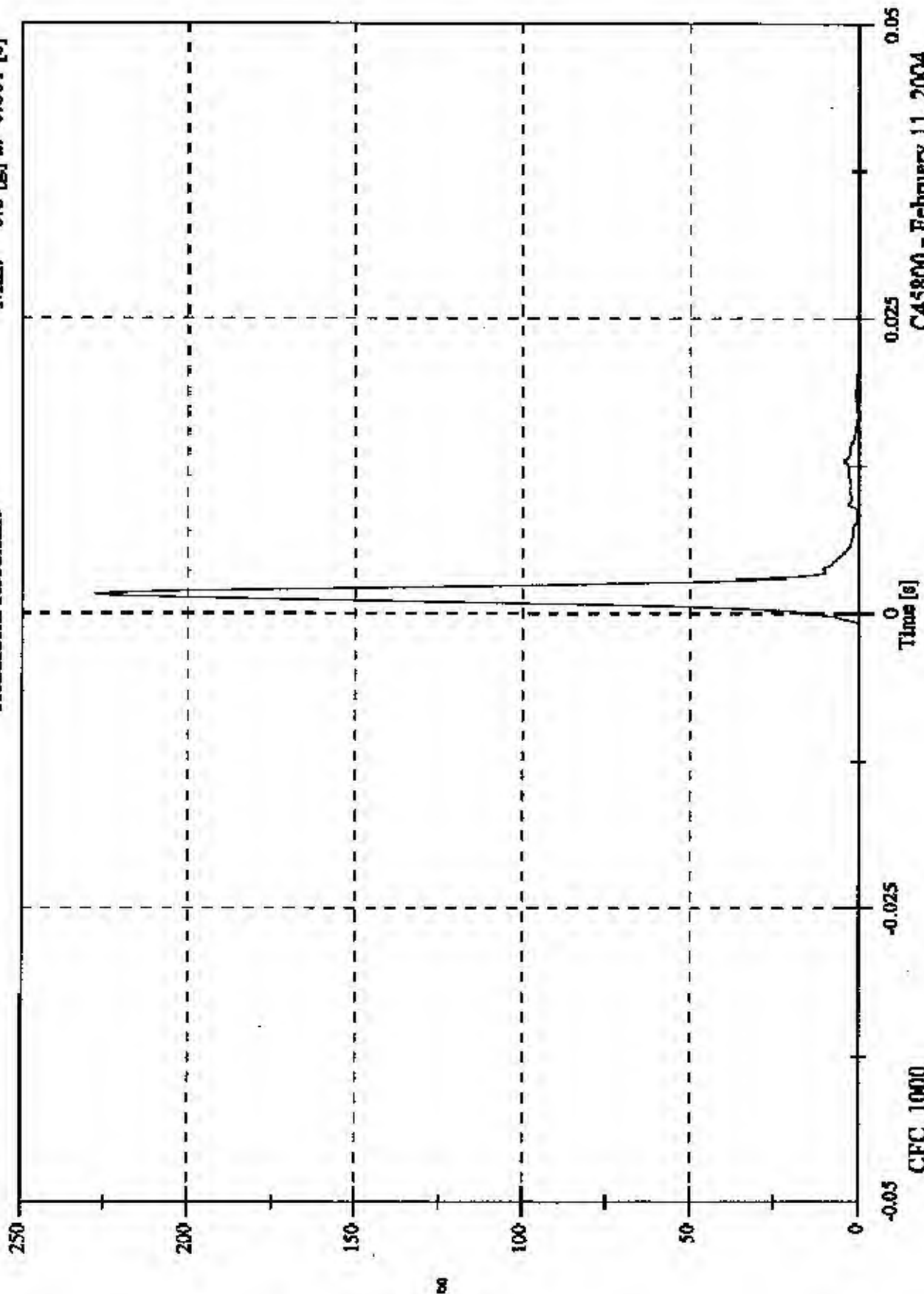
C45800 - February 11, 2004



# FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 227.8 [g] at 0.002 [s]  
Min: 0.0 [g] at -0.001 [s]



C45800 - February 11, 2004

**PART 572L  
HEAD DROP PRE-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>
<b>SERIAL NUMBER:</b>		<b>0063</b>
<b>CALIBRATION DATE:</b>		<b>February 11, 2004</b>
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>15°C to 26°C</b>	<b>24</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>18</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 G<sub>s</sub> to 275 G<sub>s</sub></b>	<b>234.8</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 G<sub>s</sub> Maximum</b>	<b>16</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

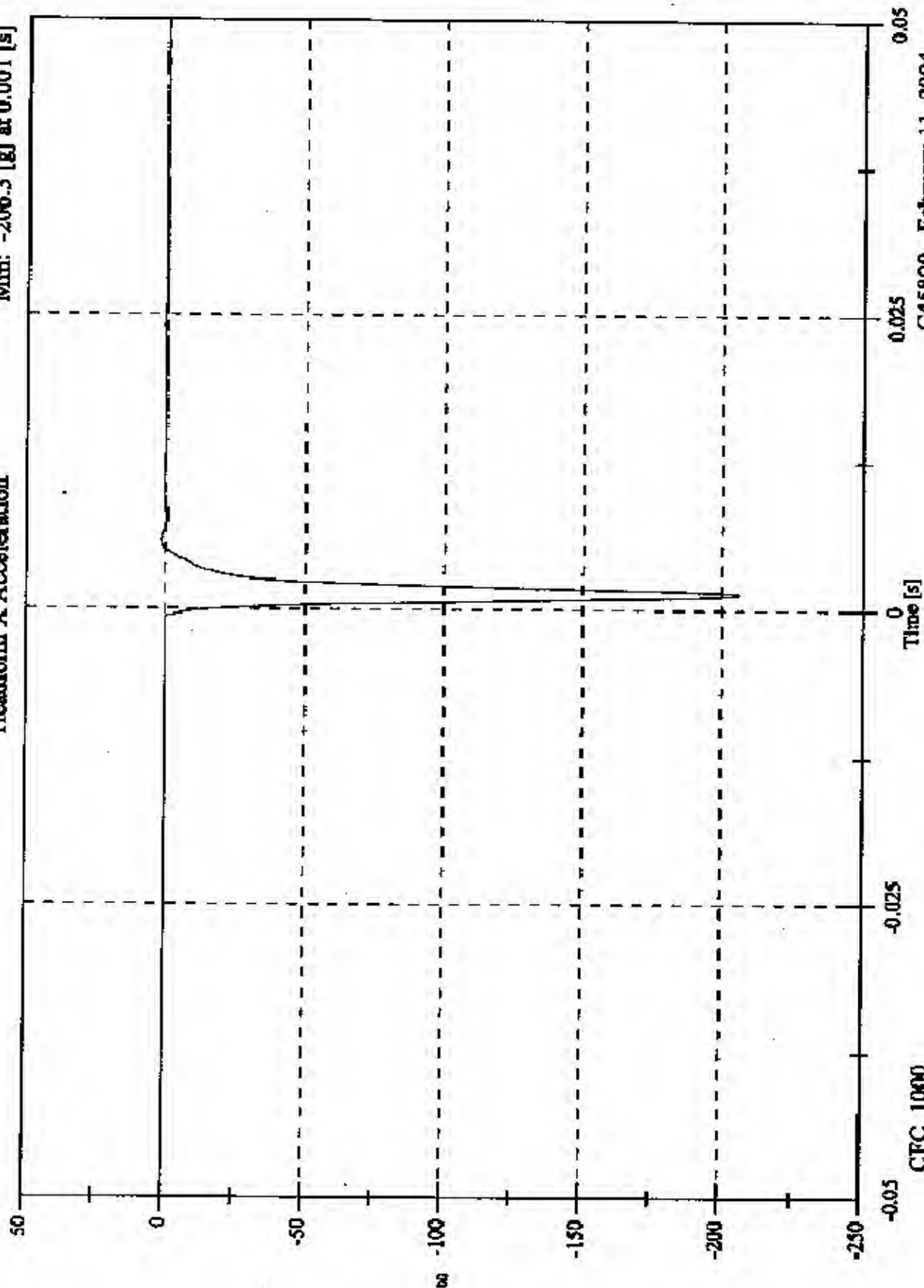
<b>ID. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J33127</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J33019</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J32782</b>	<b>08/22/03</b>	<b>02/23/04</b>

**REMARKS:**

# FMVSS 201U - Headform Calibration Drops

Max: 1.5 [g] at 0.006 [s]  
 Min: -206.3 [g] at 0.001 [s]

Headform X Acceleration



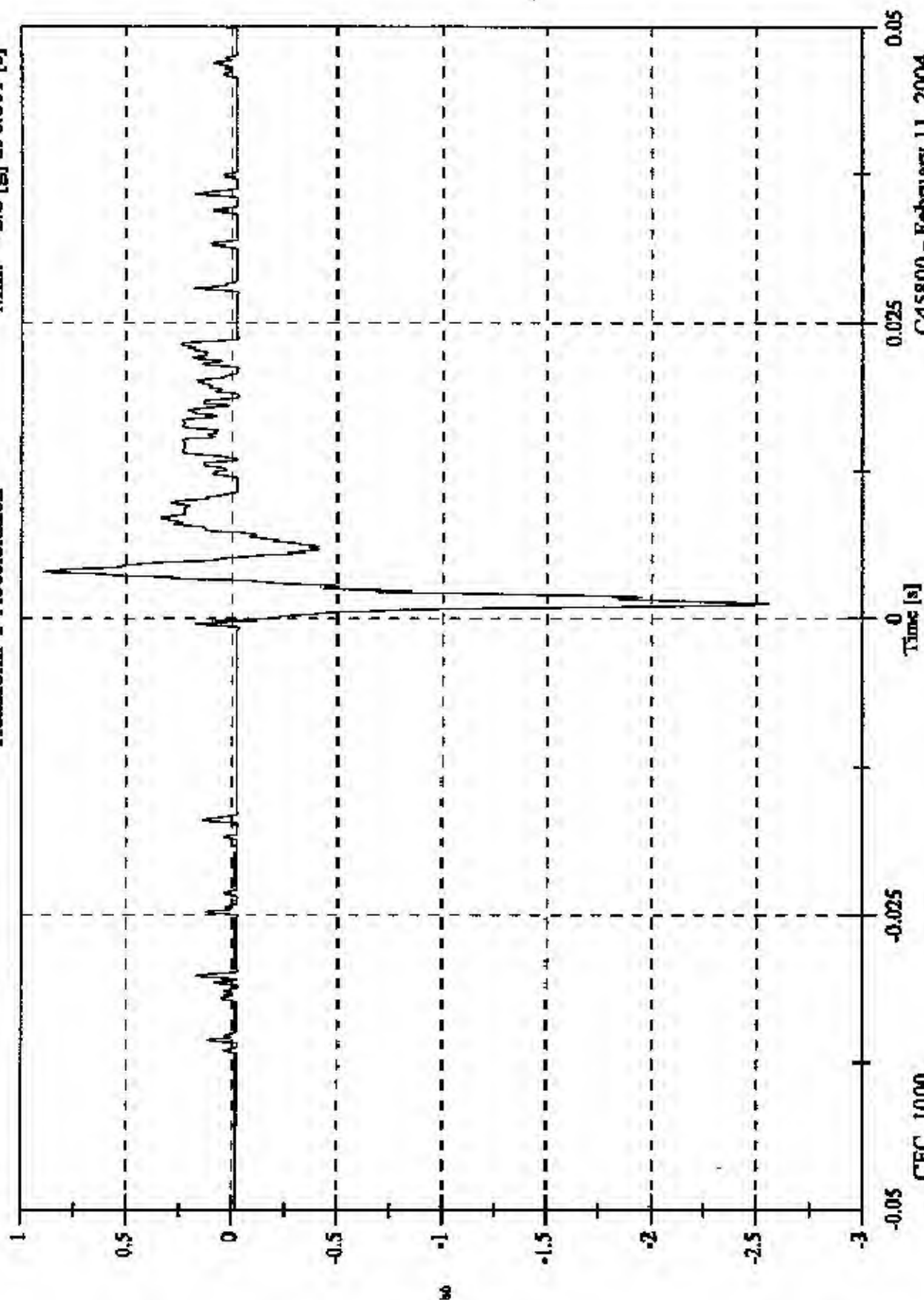
CFC\_1000



# FMVSS 201U - Headform Calibration Drops

Max: 0.9 [g] at 0.004 [s]  
Min: -2.6 [g] at 0.001 [s]

Headform Y Acceleration

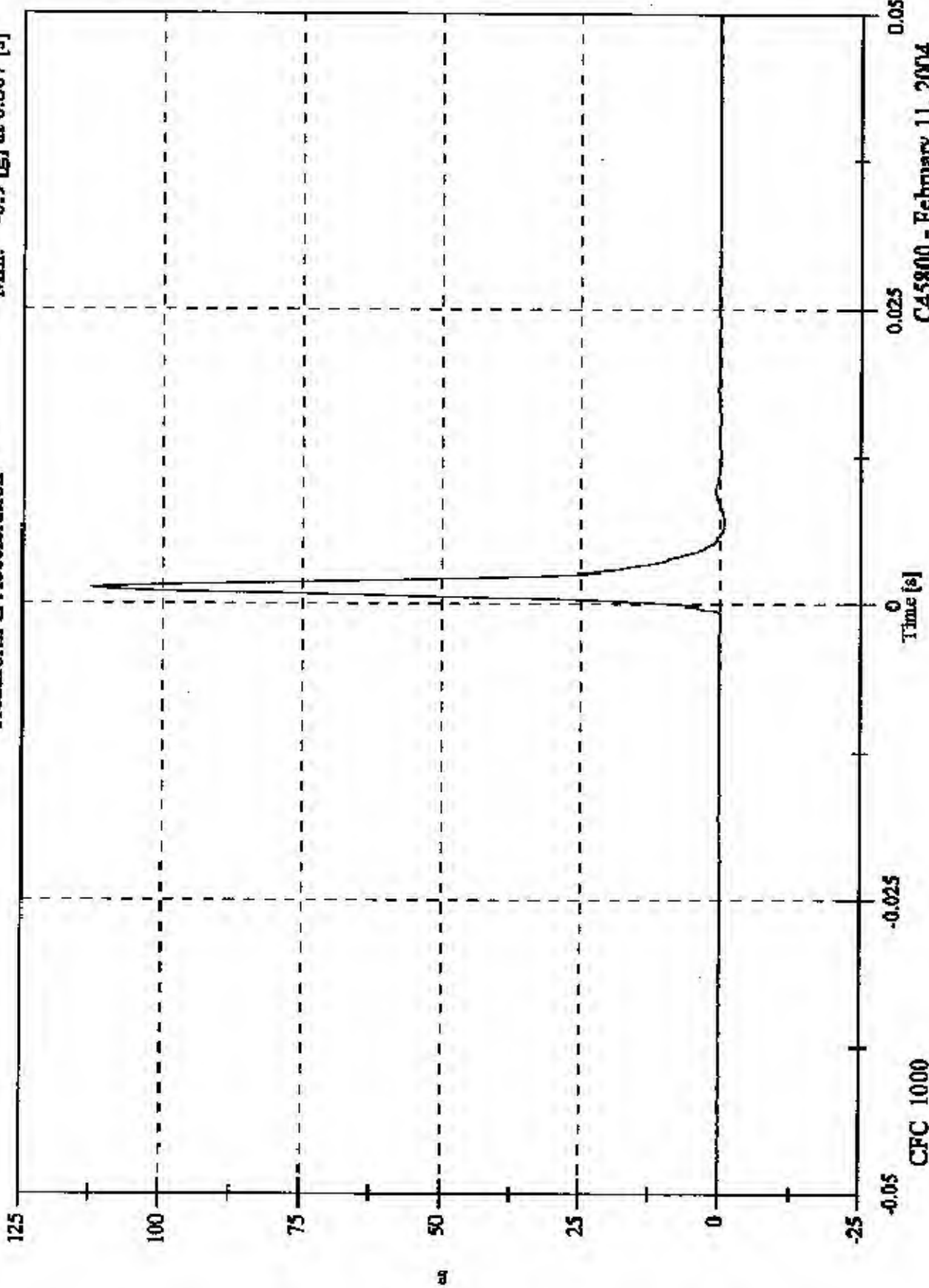


CFC\_1000

FMVSS 201U - Headform Calibration Drops

Headform Z Acceleration

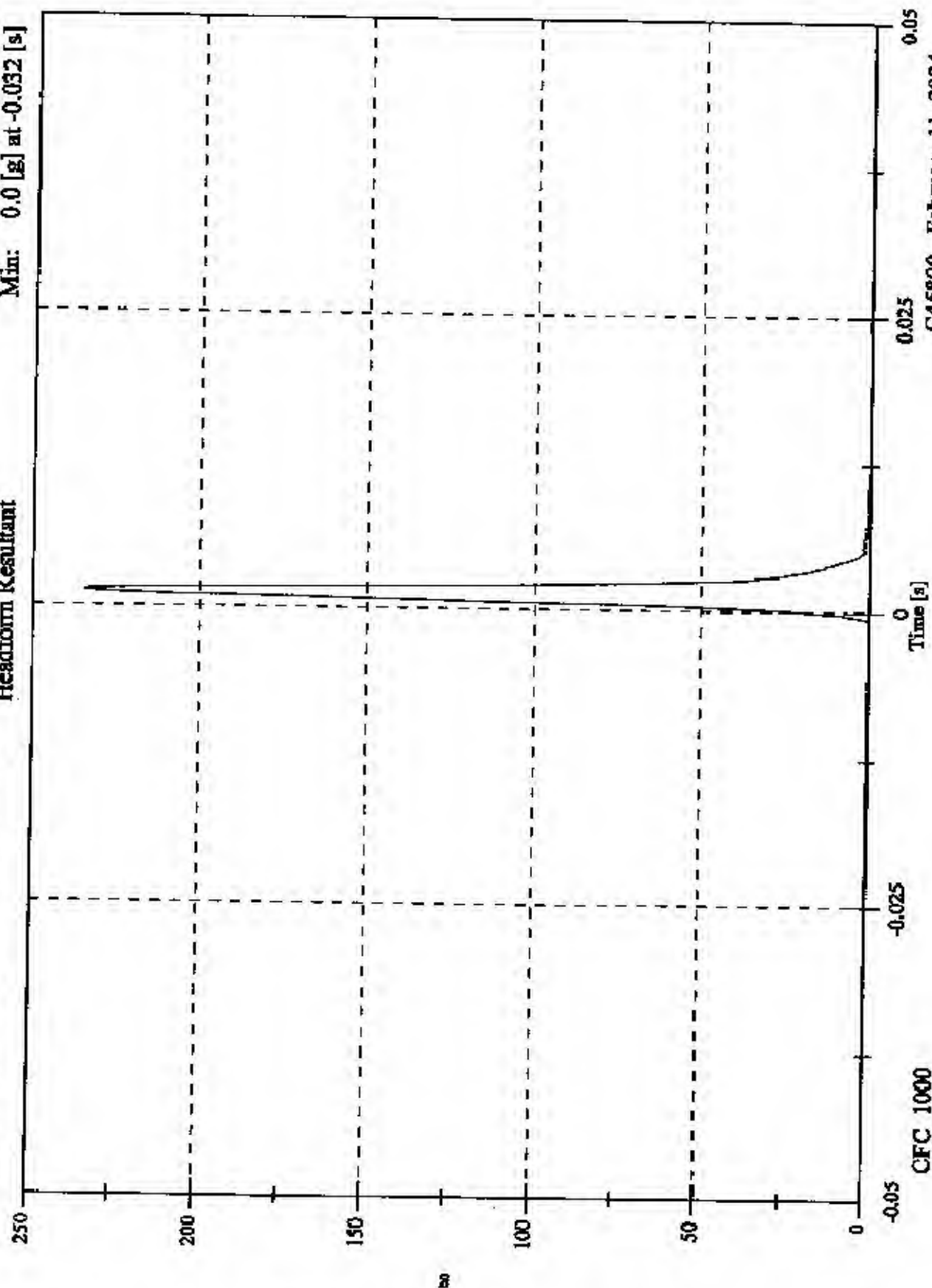
Max: 112.6 [g] at 0.001 [s]  
Min: -0.9 [g] at 0.007 [s]



# FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 234.8 [g] at 0.001 [s]  
Min: 0.0 [g] at -0.032 [s]



C45800 - February 11, 2004



**PART 572L  
HEAD DROP PRE-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>	
<b>SERIAL NUMBER:</b>		<b>806</b>	
<b>CALIBRATION DATE:</b>		<b>February 11, 2004</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>		<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>		<b>24</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>		<b>18</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>		<b>246.4</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>		<b>6.6</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>		<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

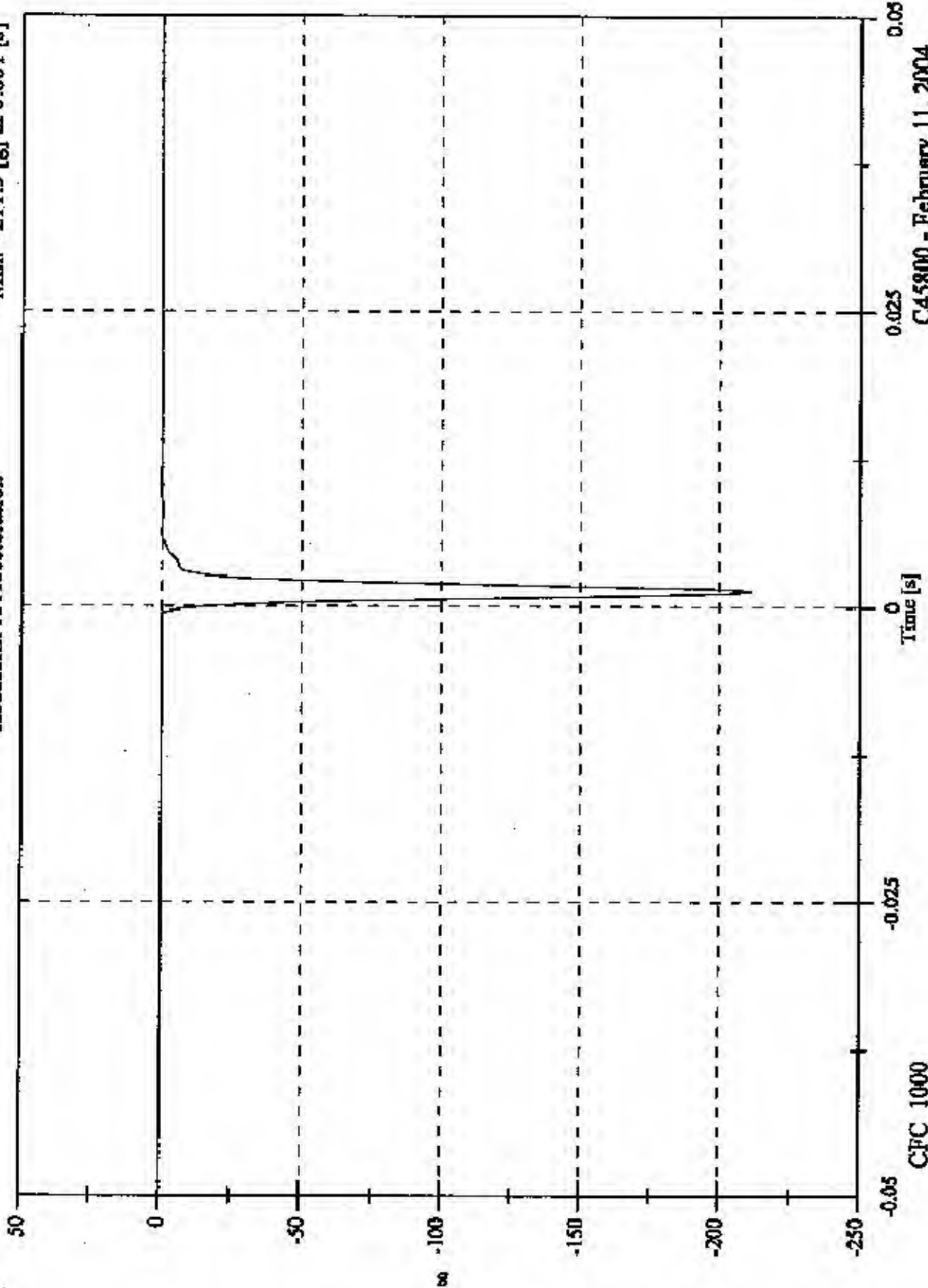
<b>ID. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J36127</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J37988</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J37854</b>	<b>08/22/03</b>	<b>02/23/04</b>

**REMARKS:**

FMVSS 201U - Headform Calibration Drops

Max: 0.3 [g] at 0.010 [s]  
Min: -211.5 [g] at 0.001 [s]

Headform X Acceleration

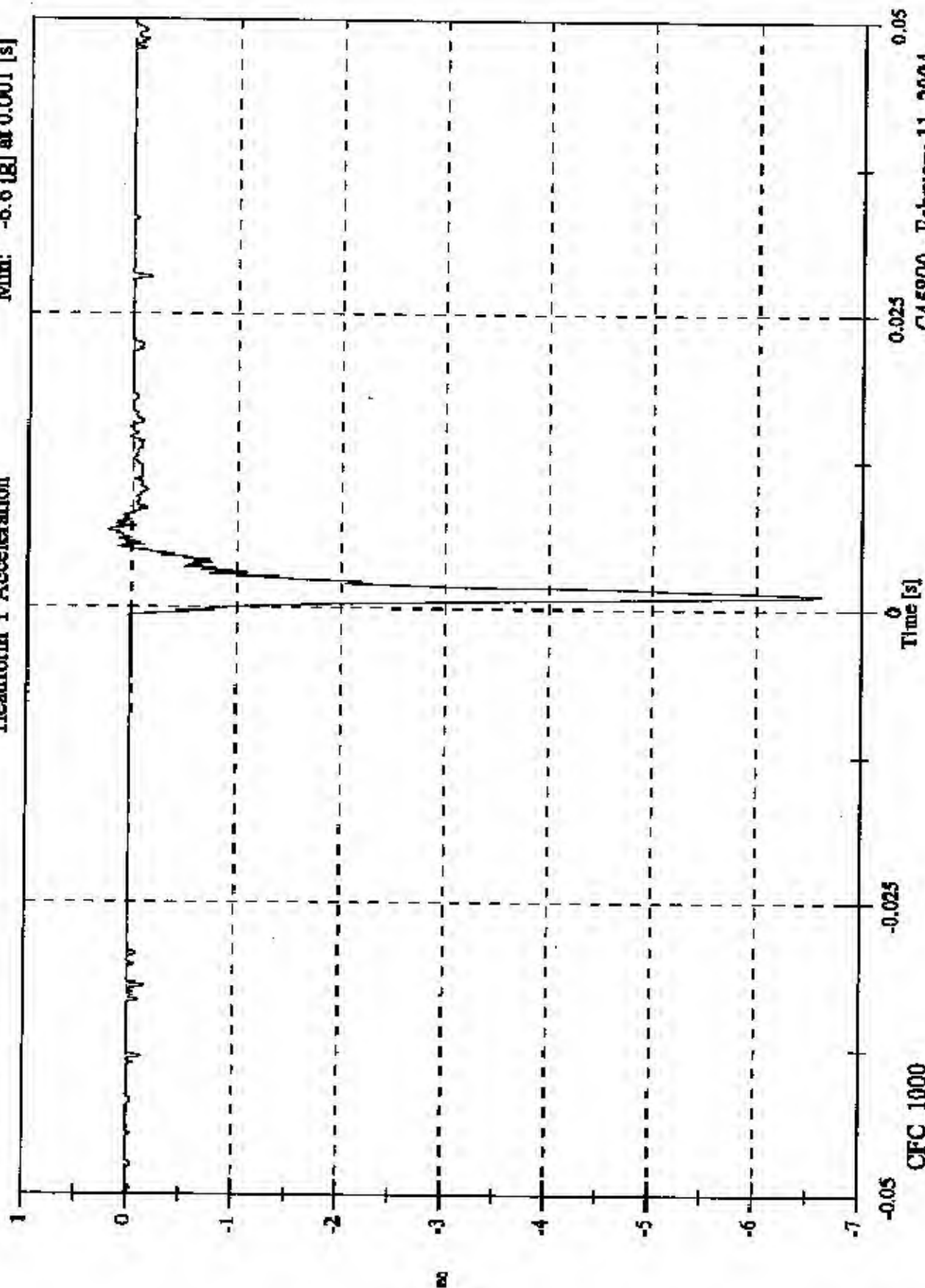


CPC\_1000

# FMVSS 201U - Headform Calibration Drops

Headform Y Acceleration

Max: 0.2 [g] at 0.007 [s]  
Min: -6.6 [g] at 0.001 [s]



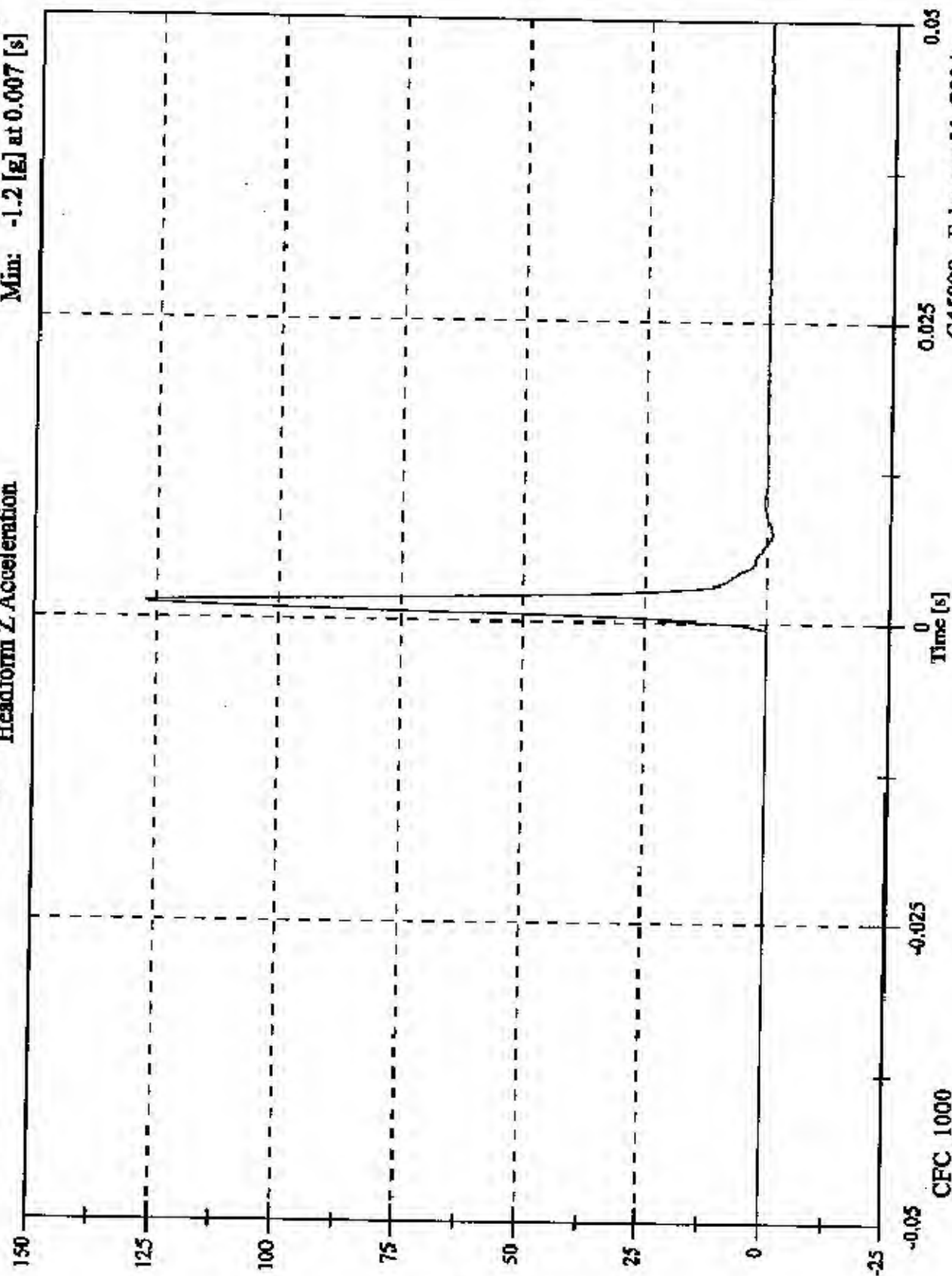
C45800 - February 11, 2004



# FMVSS 201U - Headform Calibration Drops

Max: 127.1 [g] at 0.001 [s]  
Min: -1.2 [g] at 0.007 [s]

Headform Z Acceleration

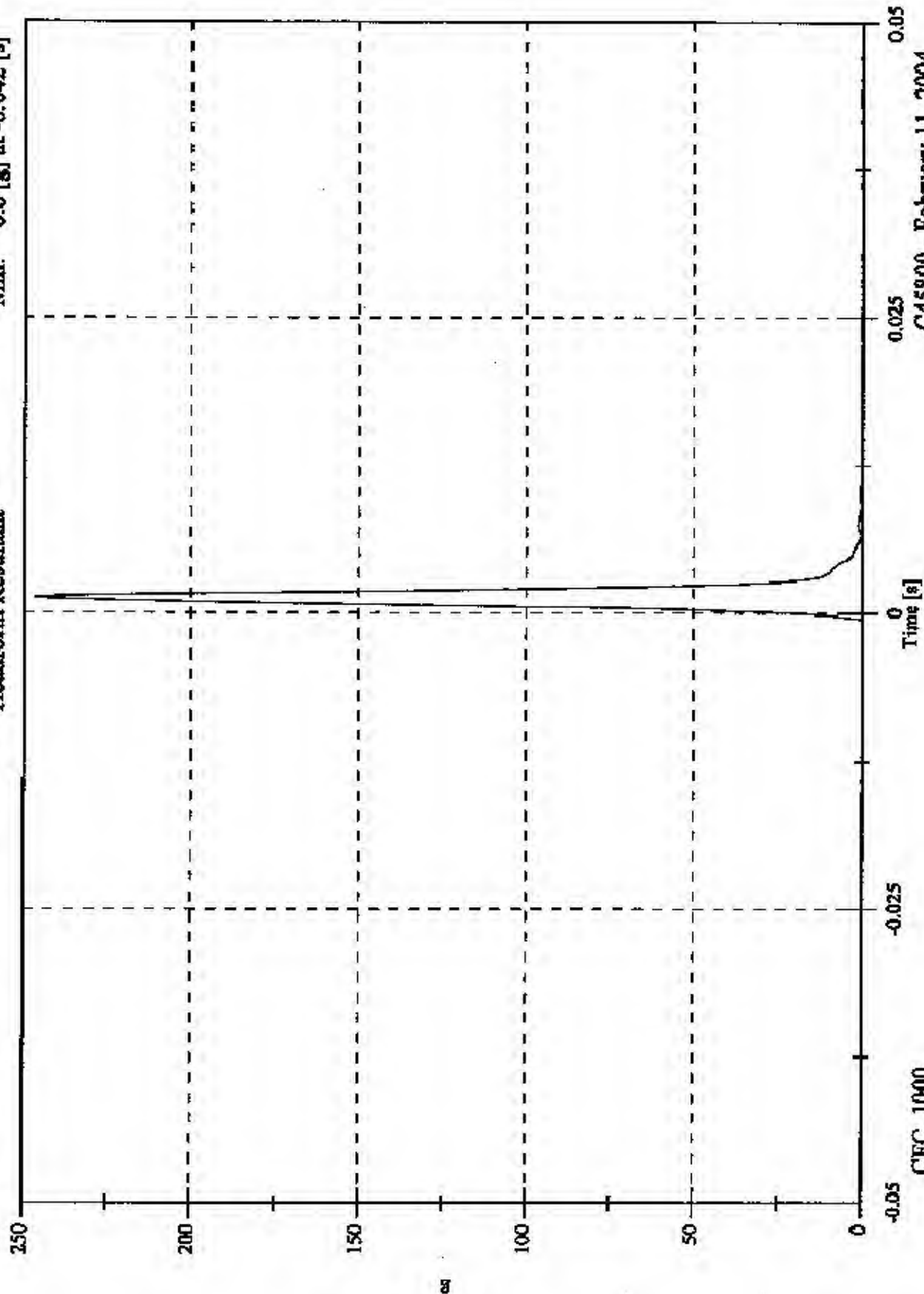


C45800 - February 11, 2004

# FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 246.4 [g] at 0.001 [s]  
Min: 0.0 [g] at -0.042 [s]



CFC\_1000

-0.025

Time [s]

0.025

C45800 - February 11, 2004

**PART 372L  
HEAD DROP PRE-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>
<b>SERIAL NUMBER:</b>		<b>0355</b>
<b>CALIBRATION DATE:</b>		<b>February 11, 2004</b>
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>24</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>18</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 G<sub>s</sub> to 275 G<sub>s</sub></b>	<b>262.5</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 G<sub>s</sub> Maximum</b>	<b>1.9</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>ID NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J28671</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J32779</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J25884</b>	<b>08/22/03</b>	<b>02/23/04</b>

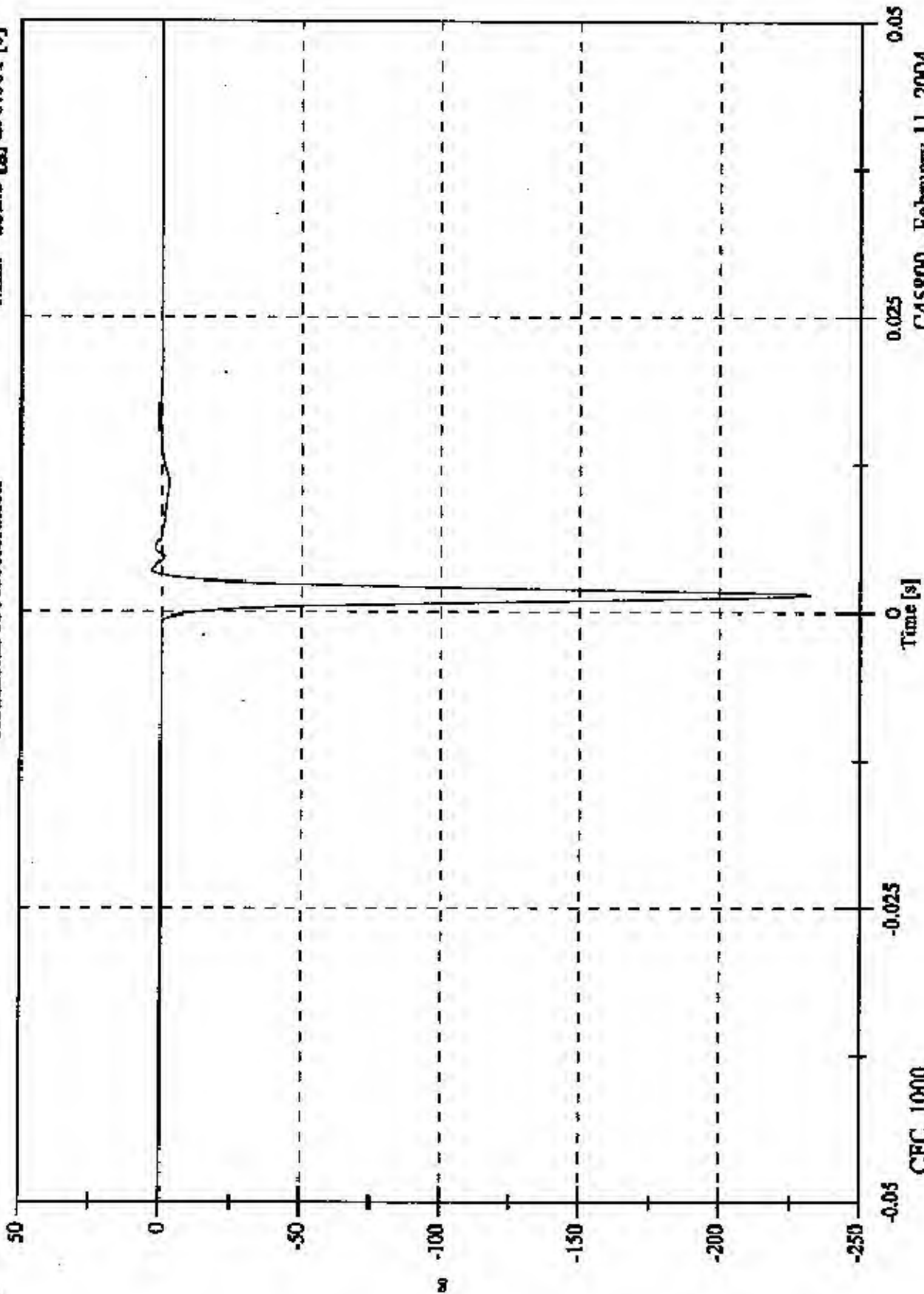
**REMARKS:**



# FMVSS 201U - Headform Calibration Drops

Max: 3.1 [g] at 0.004 [s]  
Min: -232.5 [g] at 0.001 [s]

Headform X Acceleration

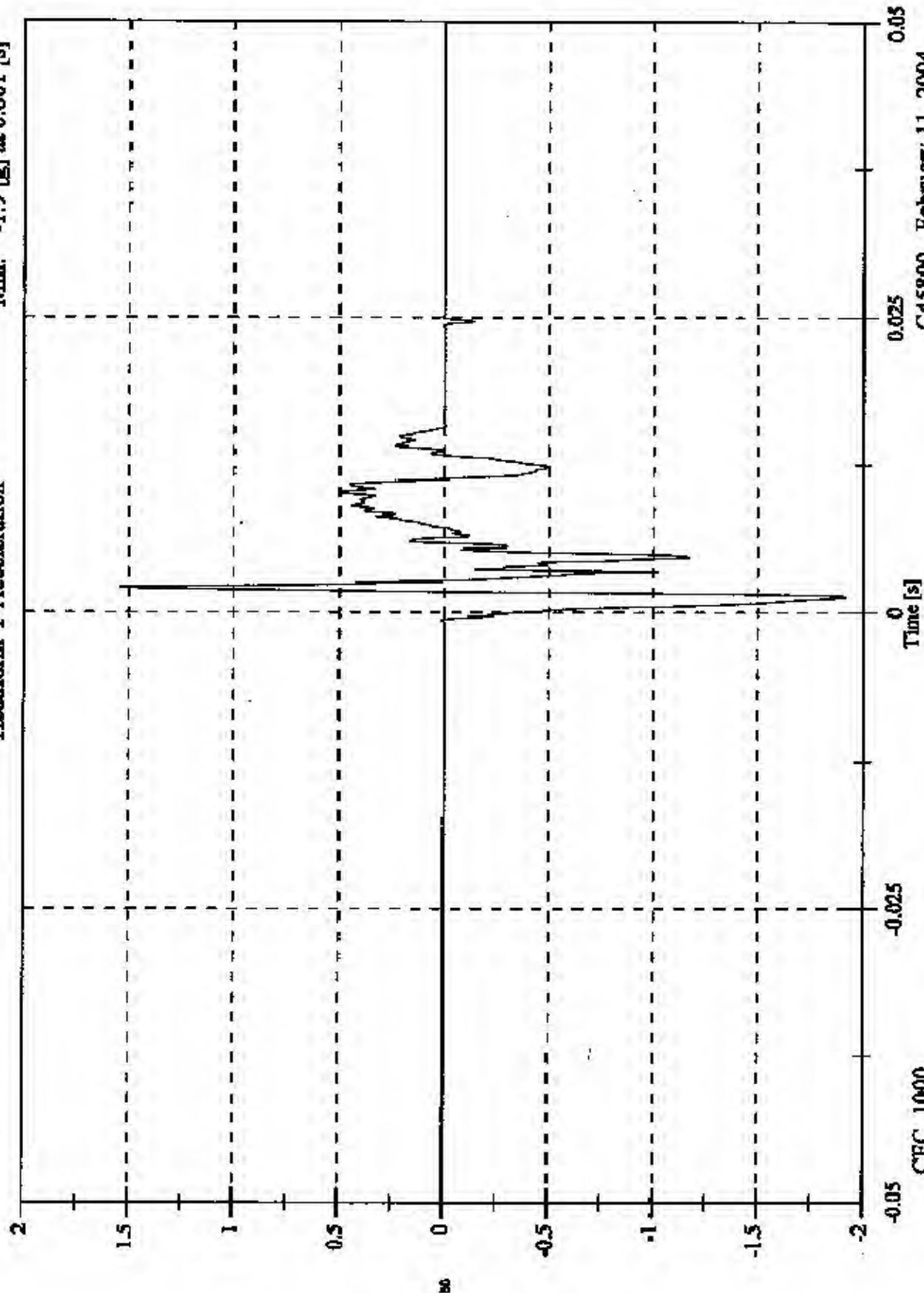


CFC\_1000

# FMVSS 201U - Headform Calibration Drops

Max: 1.5 [g] at 0.002 [s]  
Min: -1.9 [g] at 0.001 [s]

Headform Y Acceleration

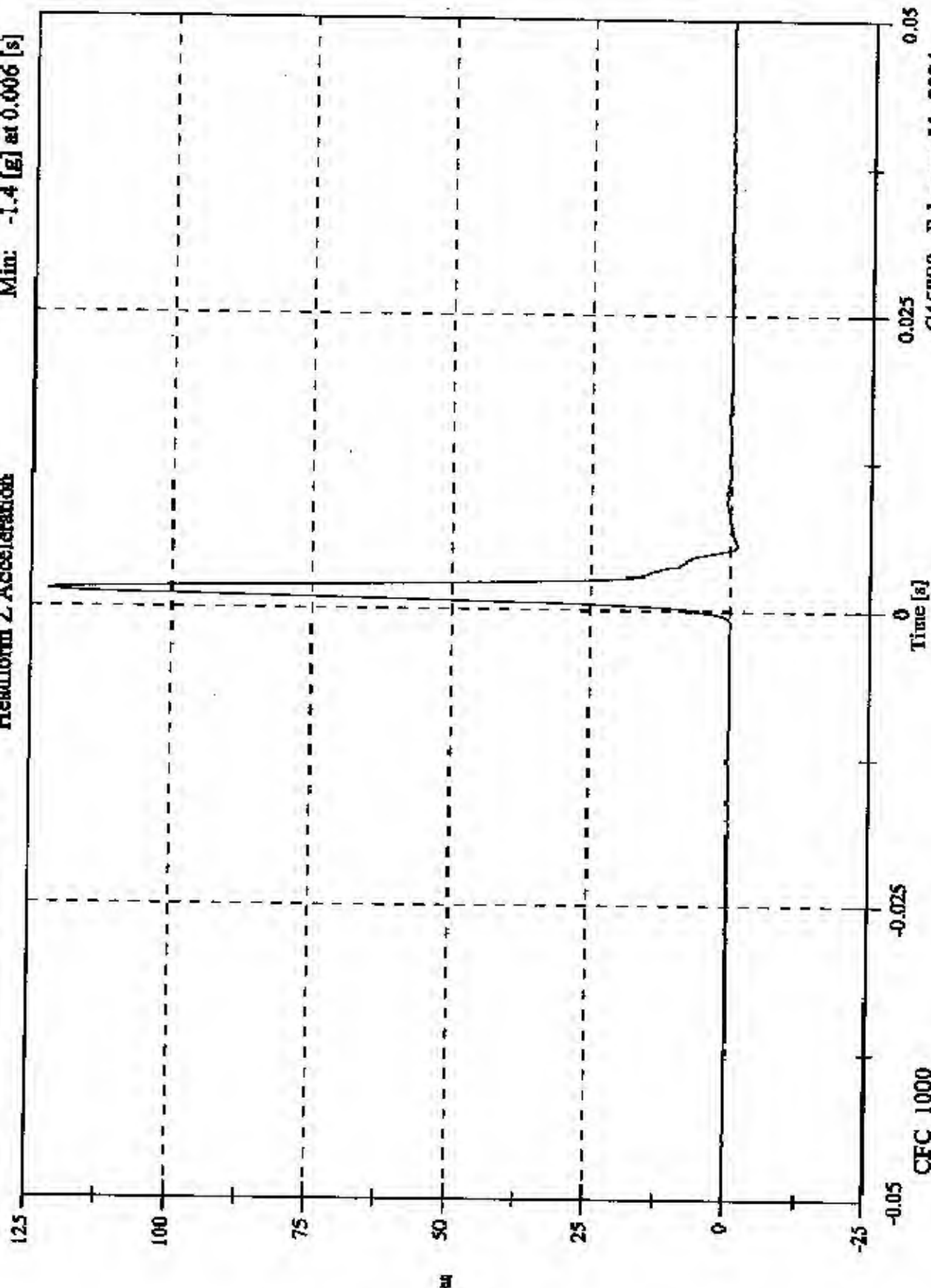


C45800 - February 11, 2004

FMVSS 201U - Headform Calibration Drops

Max: 121.9 [g] at 0.001 [s]  
Min: -1.4 [g] at 0.006 [s]

Headform Z Acceleration



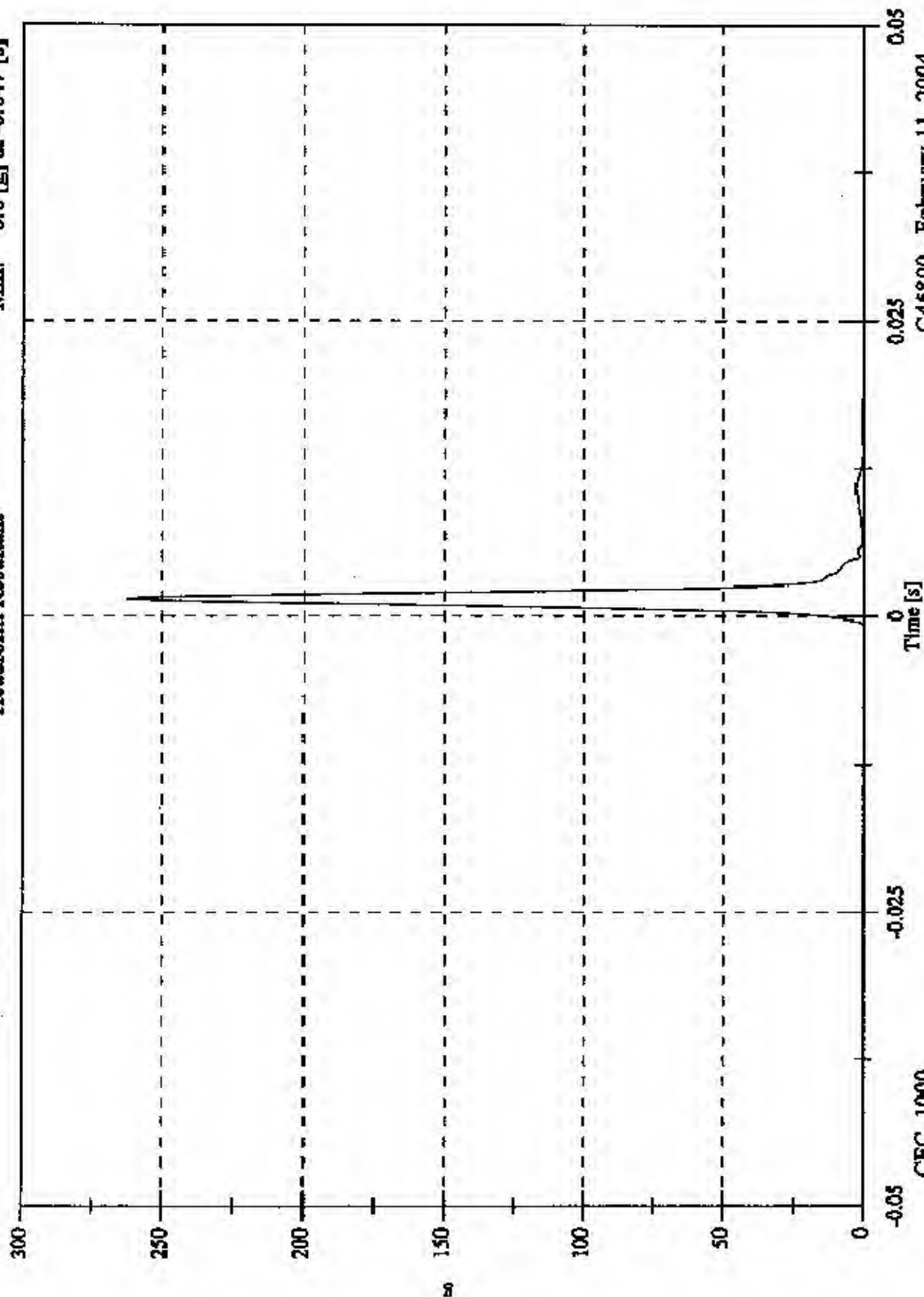
C45800 - February 11, 2004



# FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 262.5 [g] at 0.001 [s]  
Min: 0.0 [g] at -0.047 [s]



C45800 - February 11, 2004

**PART 572L  
HEAD DROP PRE-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>
<b>SERIAL NUMBER:</b>		<b>1165</b>
<b>CALIBRATION DATE:</b>		<b>February 11, 2004</b>
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>24</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>18</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>267.8</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>13.8</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

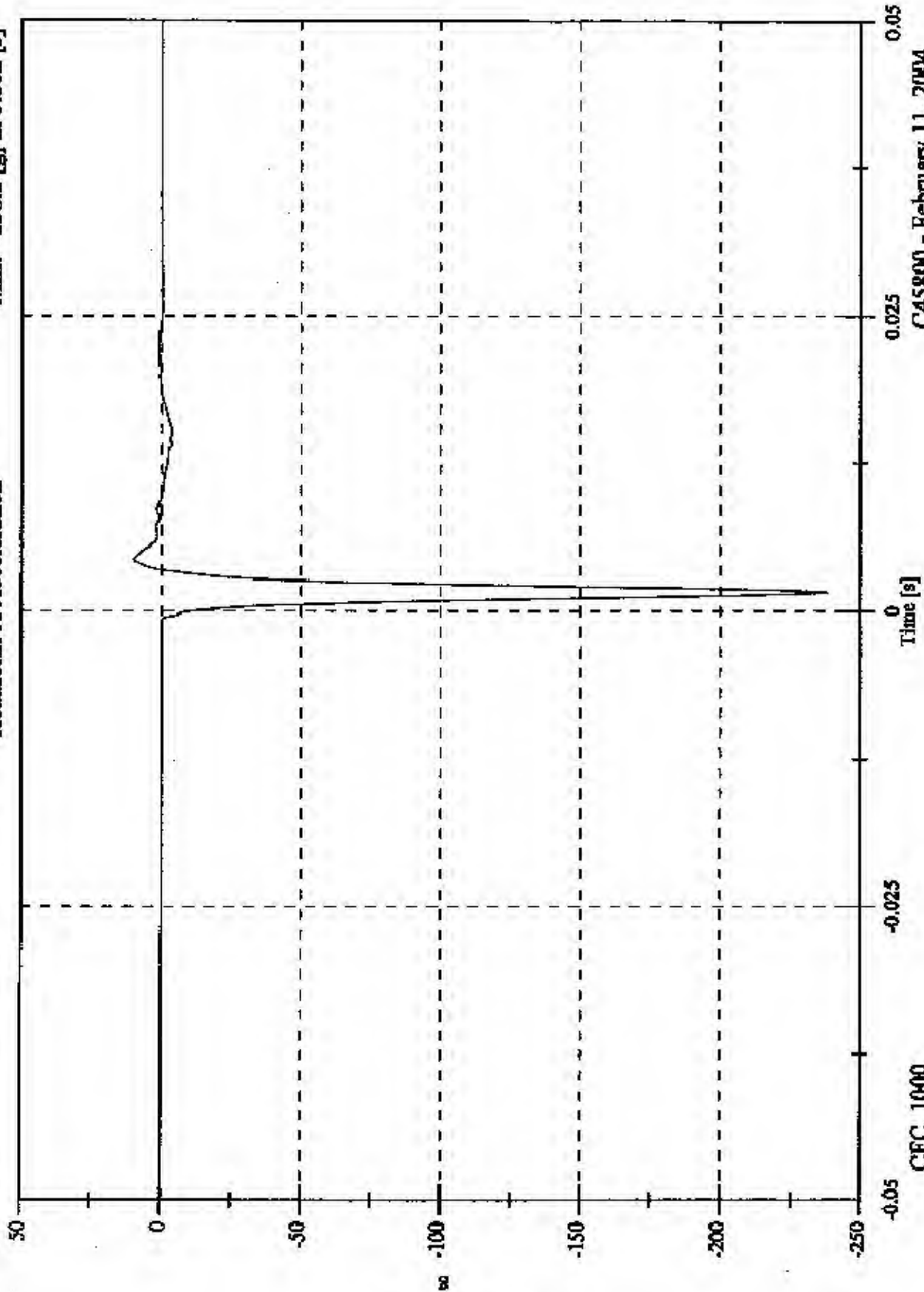
<b>LD NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J41806</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J40994</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J41007</b>	<b>08/22/03</b>	<b>02/23/04</b>

**REMARKS:**

FMVSS 201U - Headform Calibration Drops

Headform X Acceleration

Max: 9.9 [g] at 0.004 [s]  
Min: -238.2 [g] at 0.002 [s]



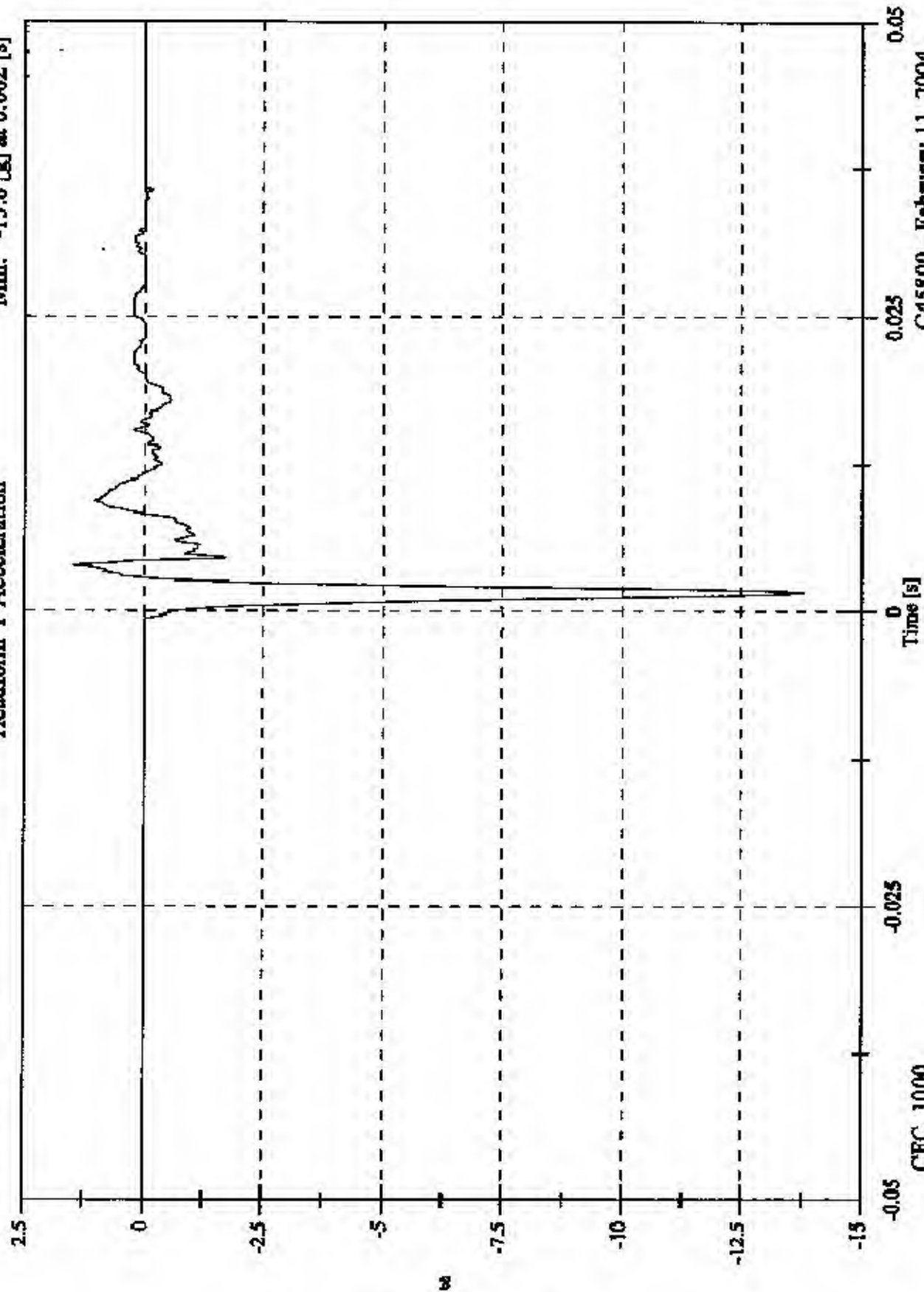
C45800 - February 11, 2004



FMVSS 201U - Headform Calibration Drops

Max: 1.5 [g] at 0.004 [s]  
Min: -13.8 [g] at 0.002 [s]

Headform Y Acceleration



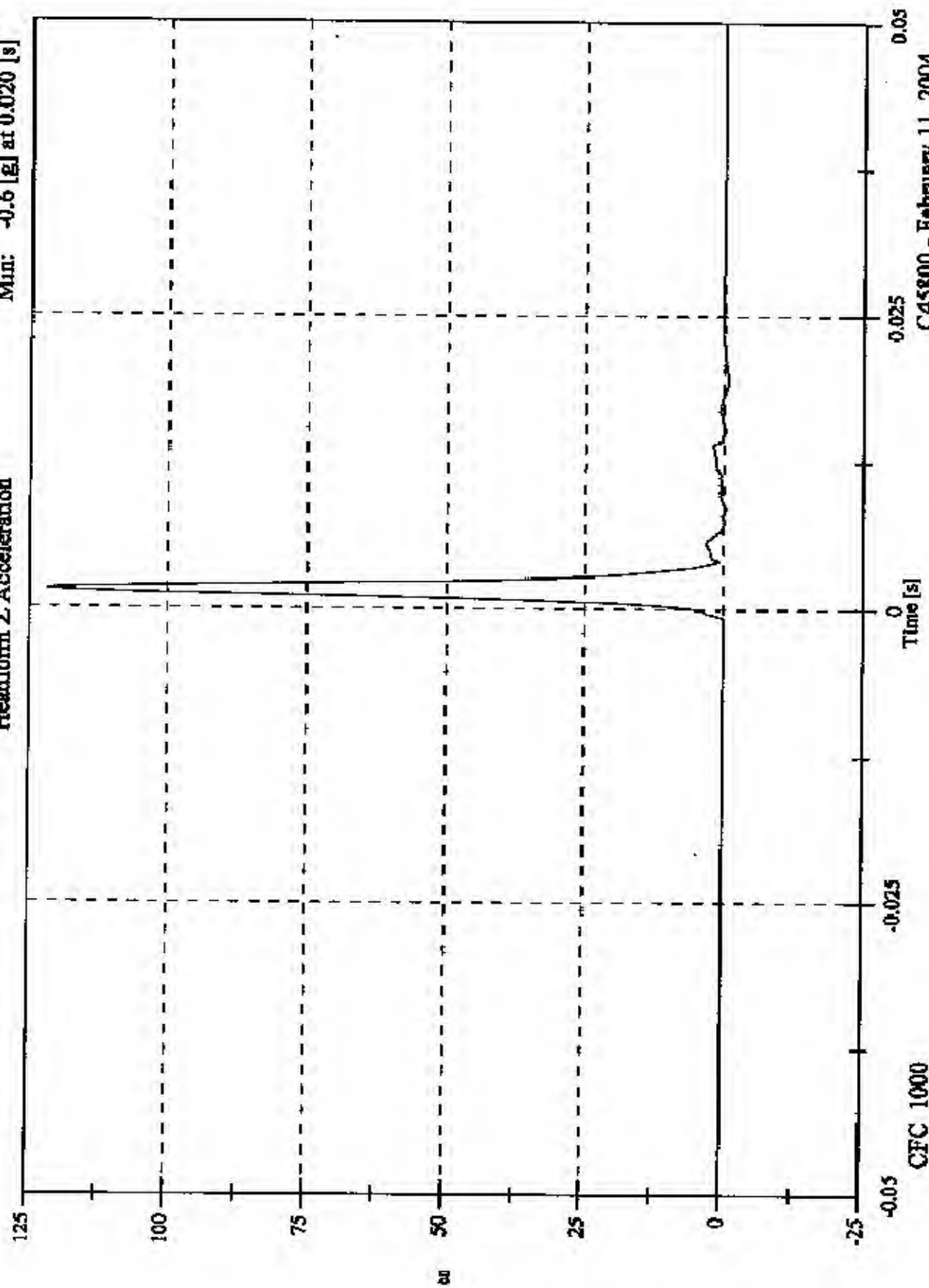
Time [s]

CFC\_1000

FMVSS 201U - Headform Calibration Drops

Max: 121.8 [g] at 0.002 [s]  
Min: -0.6 [g] at 0.020 [s]

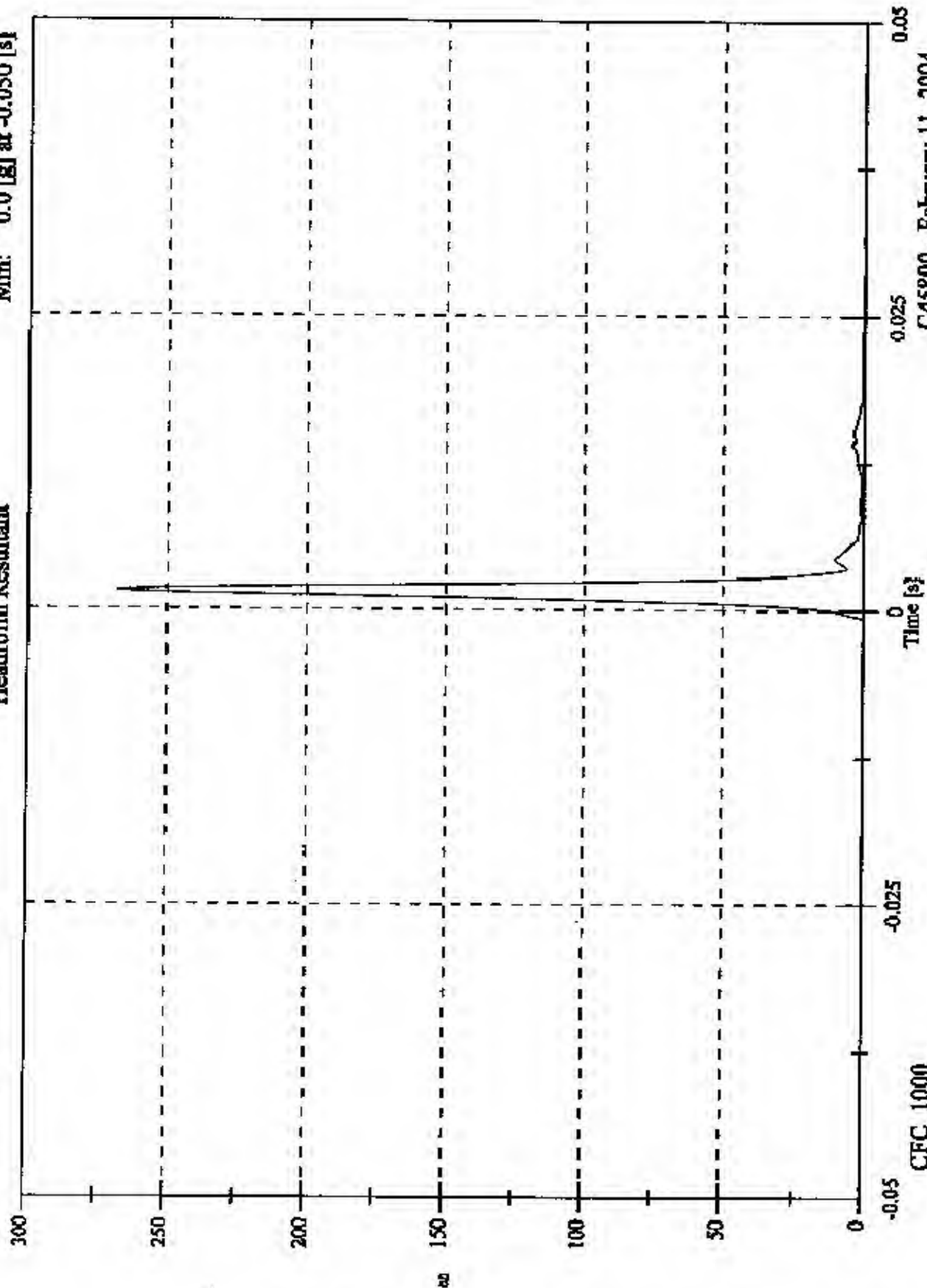
Headform Z Acceleration



# FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 267.8 [g] at 0.002 [s]  
Min: 0.0 [g] at -0.050 [s]



C45800 - February 11, 2004



**PART 572L  
HEAD DROP POST-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>	
<b>SERIAL NUMBER:</b>		<b>0642</b>	
<b>CALIBRATION DATE:</b>		<b>February 20, 2004</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>23.3</b>	
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>29</b>	
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>262.9</b>	
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>12.2</b>	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

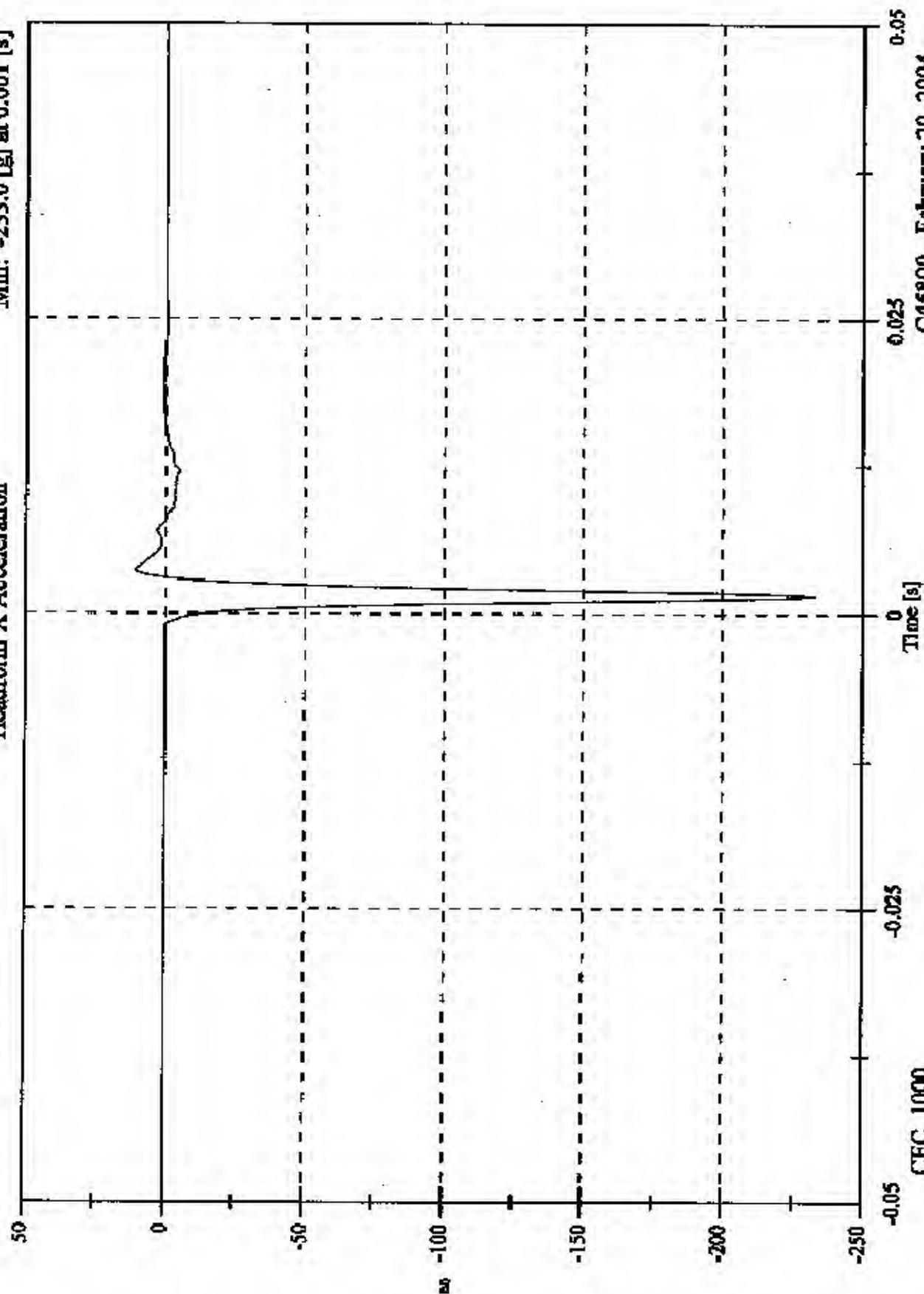
<b>ID NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J24876</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J33030</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J31009</b>	<b>08/22/03</b>	<b>02/23/04</b>

**REMARKS:**

# FMVSS 201U - Headform Calibration Drops

Max: 11.1 [g] at 0.004 [s]  
Min: -233.0 [g] at 0.001 [s]

Headform X Acceleration

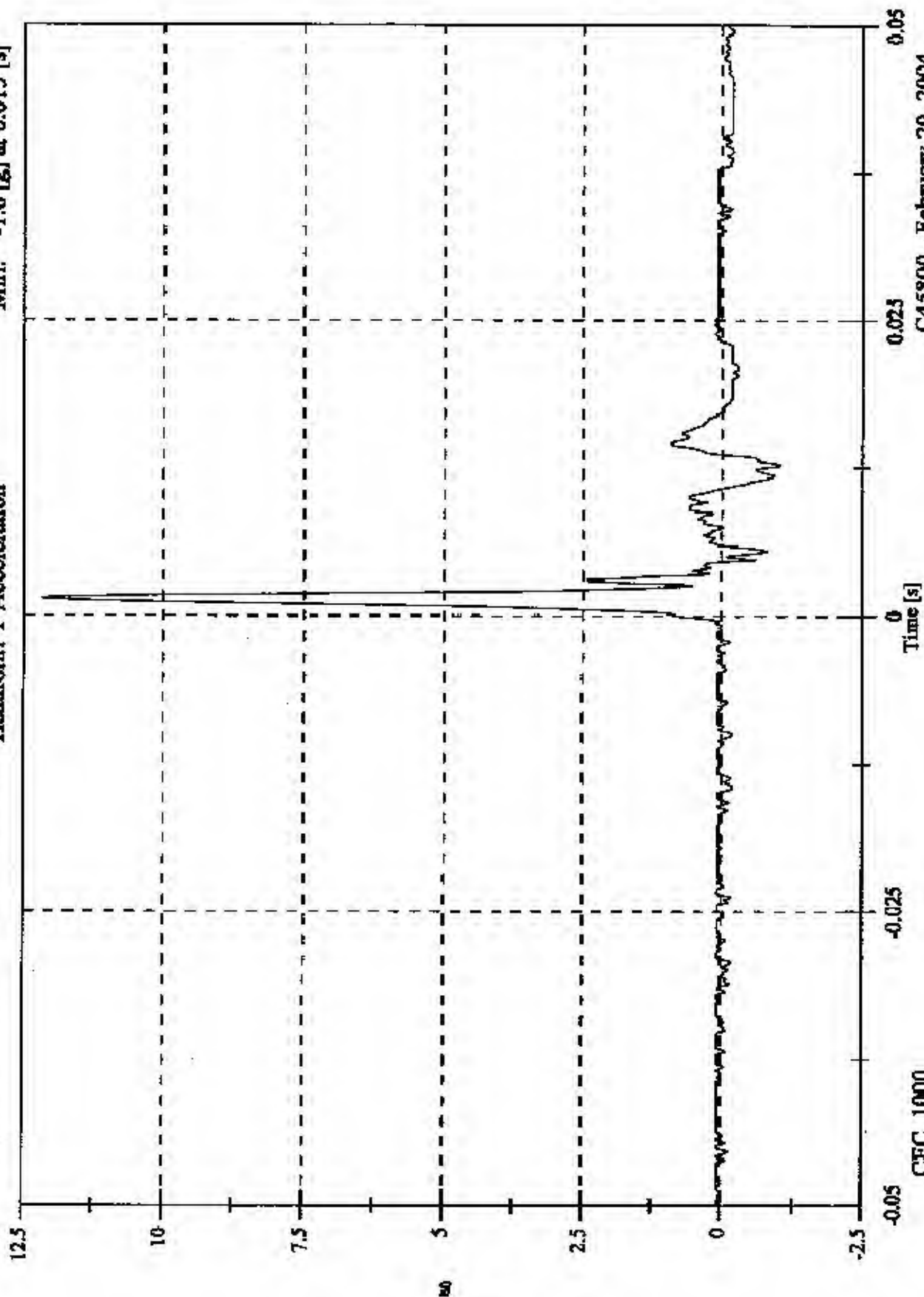


C45800 - February 20, 2004

# FMVSS 201U - Headform Calibration Drops

Max: 12.2 [g] at 0.001 [s]  
Min: -1.0 [g] at 0.013 [s]

Headform Y Acceleration



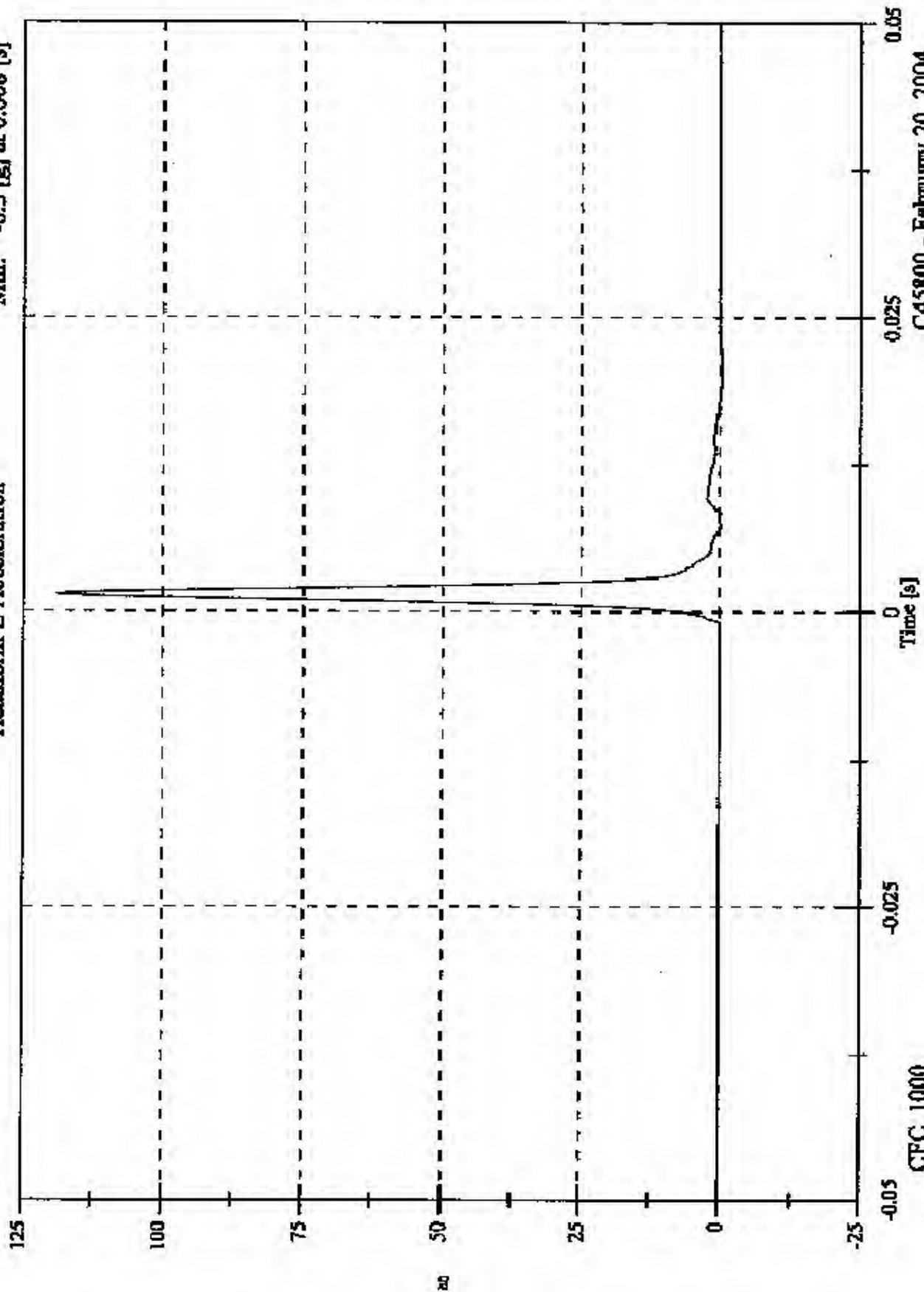
C45800 - February 20, 2004



FMVSS 201U - Headform Calibration Drops

Max: 119.1 [g] at 0.001 [s]  
Min: -0.3 [g] at 0.008 [s]

Headform Z Acceleration

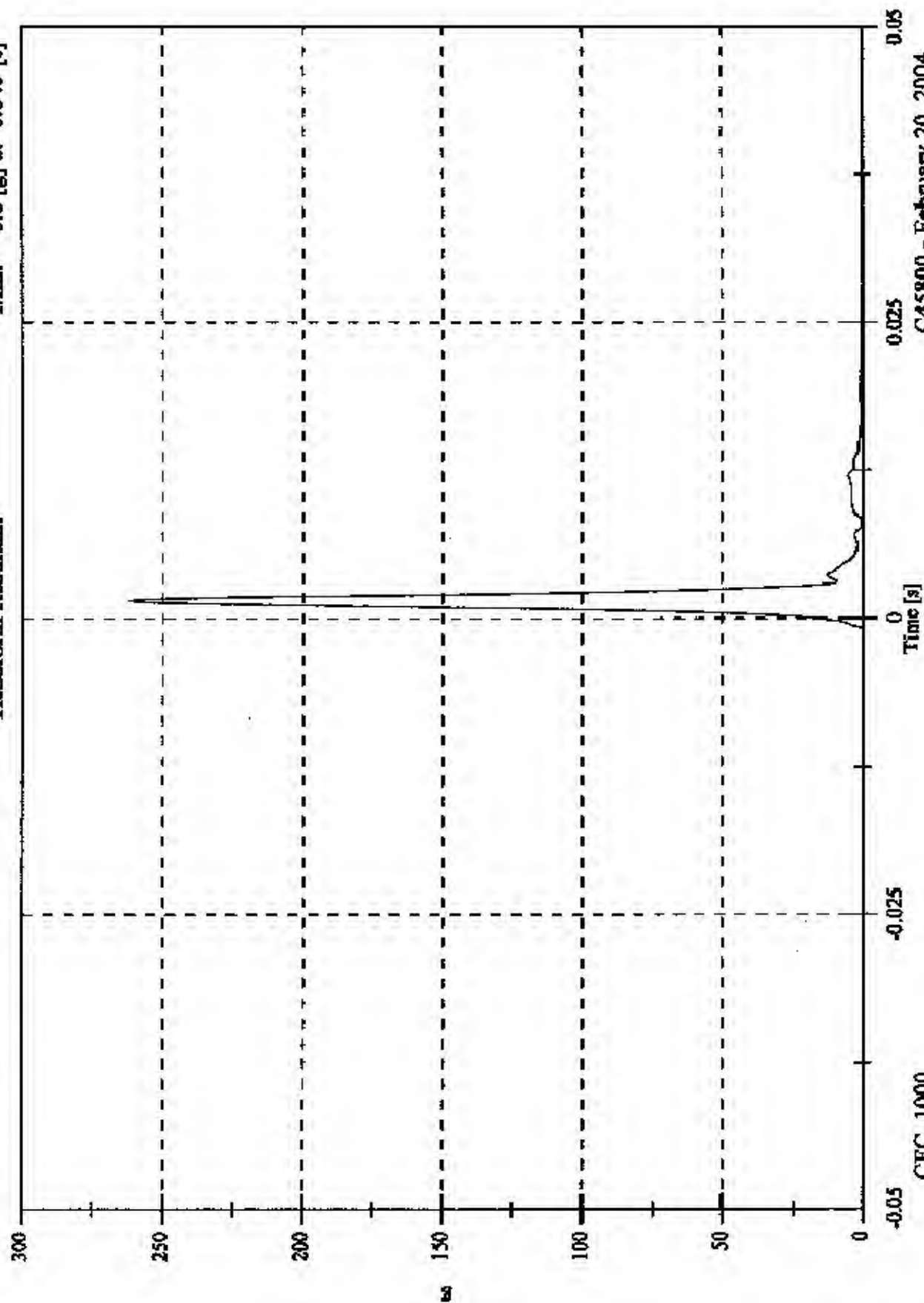


C45800 - February 20, 2004

# FMVSS 201U - Headform Calibration Drops

Max: 262.0 [g] at 0.001 [s]  
Min: 0.0 [g] at -0.045 [s]

Headform Resultant



C45800 - February 20, 2004

**PART 571L  
HEAD DROP POST-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>	
<b>SERIAL NUMBER:</b>		<b>9062</b>	
<b>CALIBRATION DATE:</b>		<b>February 20, 2004</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>		<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>		<b>23.3</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>		<b>29</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>		<b>238.4</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>		<b>13.9</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>		<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>ID NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J33127</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7164-2000T</b>	<b>J33019</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J32782</b>	<b>08/22/03</b>	<b>02/23/04</b>

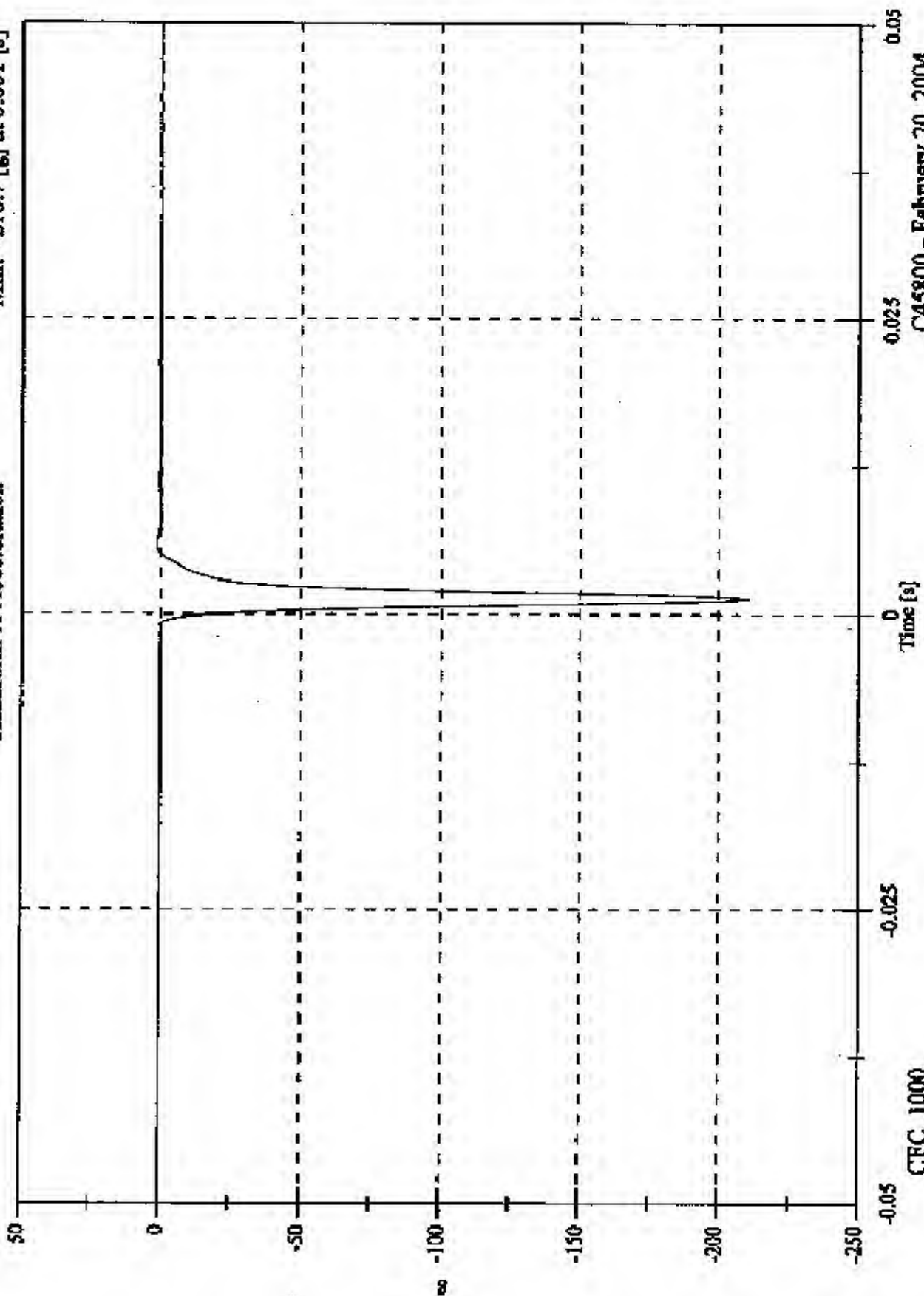
**REMARKS:**



FMVSS 201U - Headform Calibration Drops

Max: 1.2 [g] at 0.006 [s]  
Min: -210.7 [g] at 0.001 [s]

Headform X Acceleration

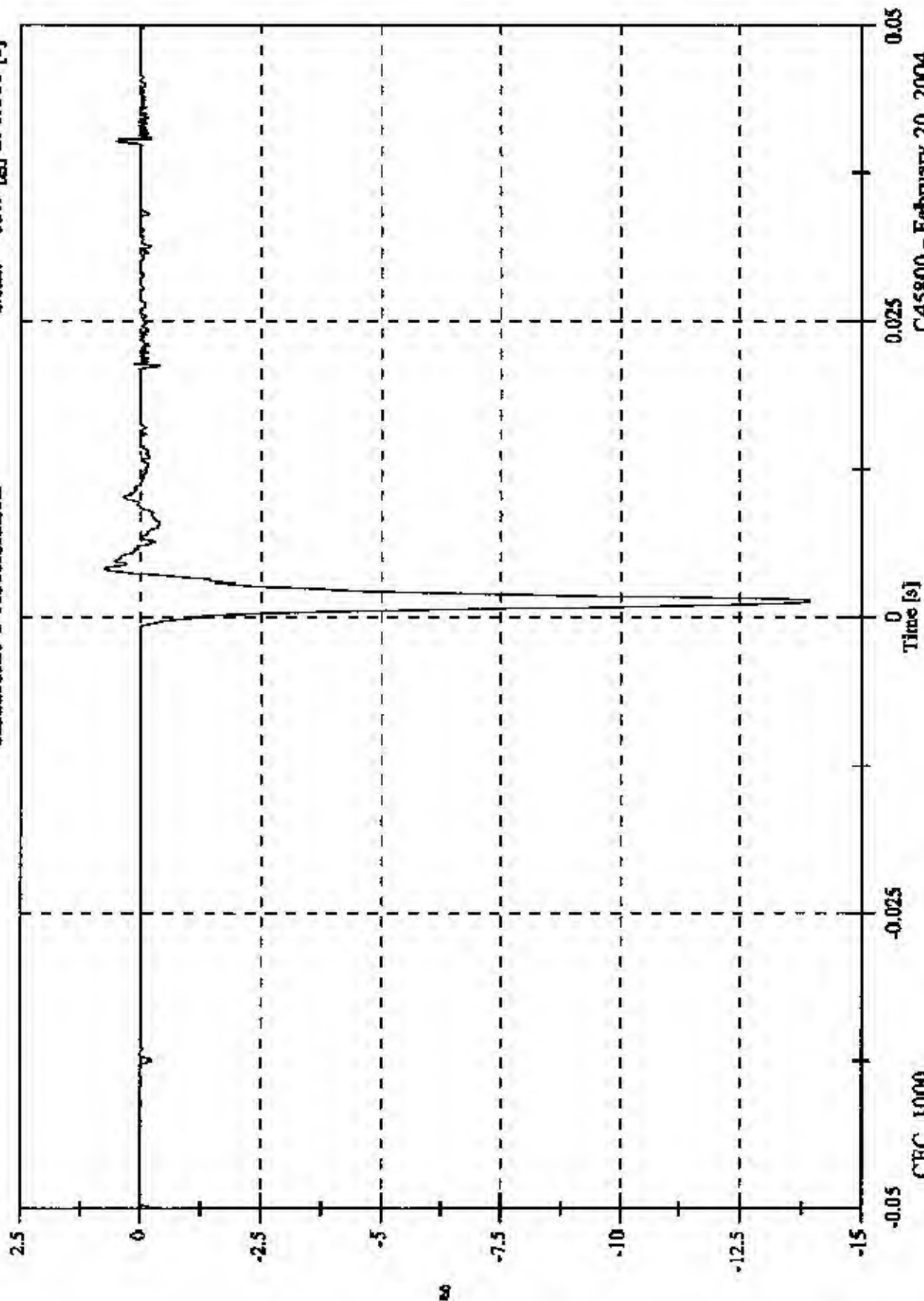


C45800 - February 20, 2004

# FMVSS 201U - Headform Calibration Drops

Max: 0.8 [g] at 0.004 [s]  
Min: -13.9 [g] at 0.001 [s]

Headform Y Acceleration



CFC\_1000

-0.025

Time [s]

0.025

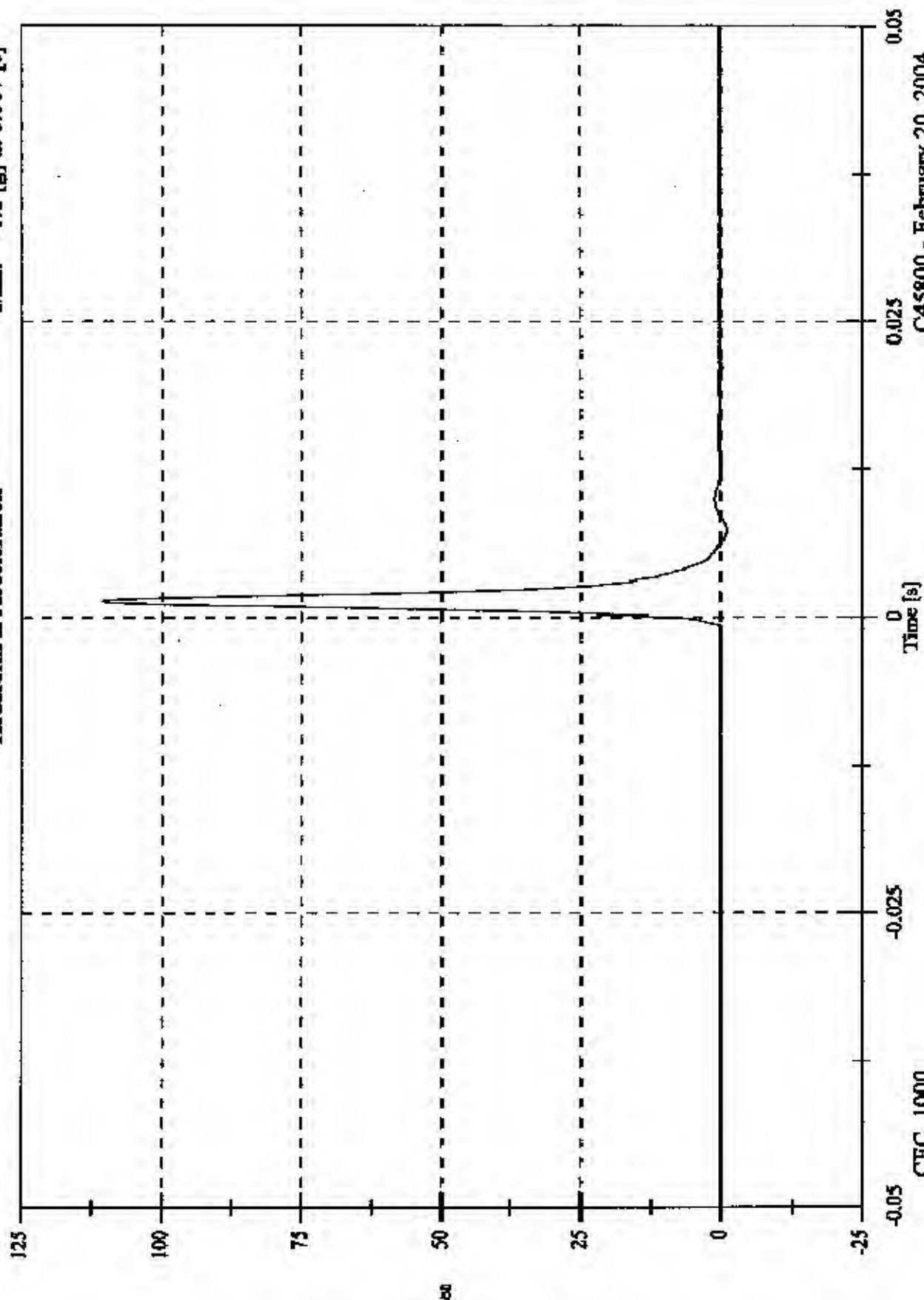
0.05

C45800 - February 20, 2004

# FMVSS 201U - Headform Calibration Drops

Headform Z Acceleration

Max: 110.8 [g] at 0.001 [s]  
Min: -1.1 [g] at 0.007 [s]



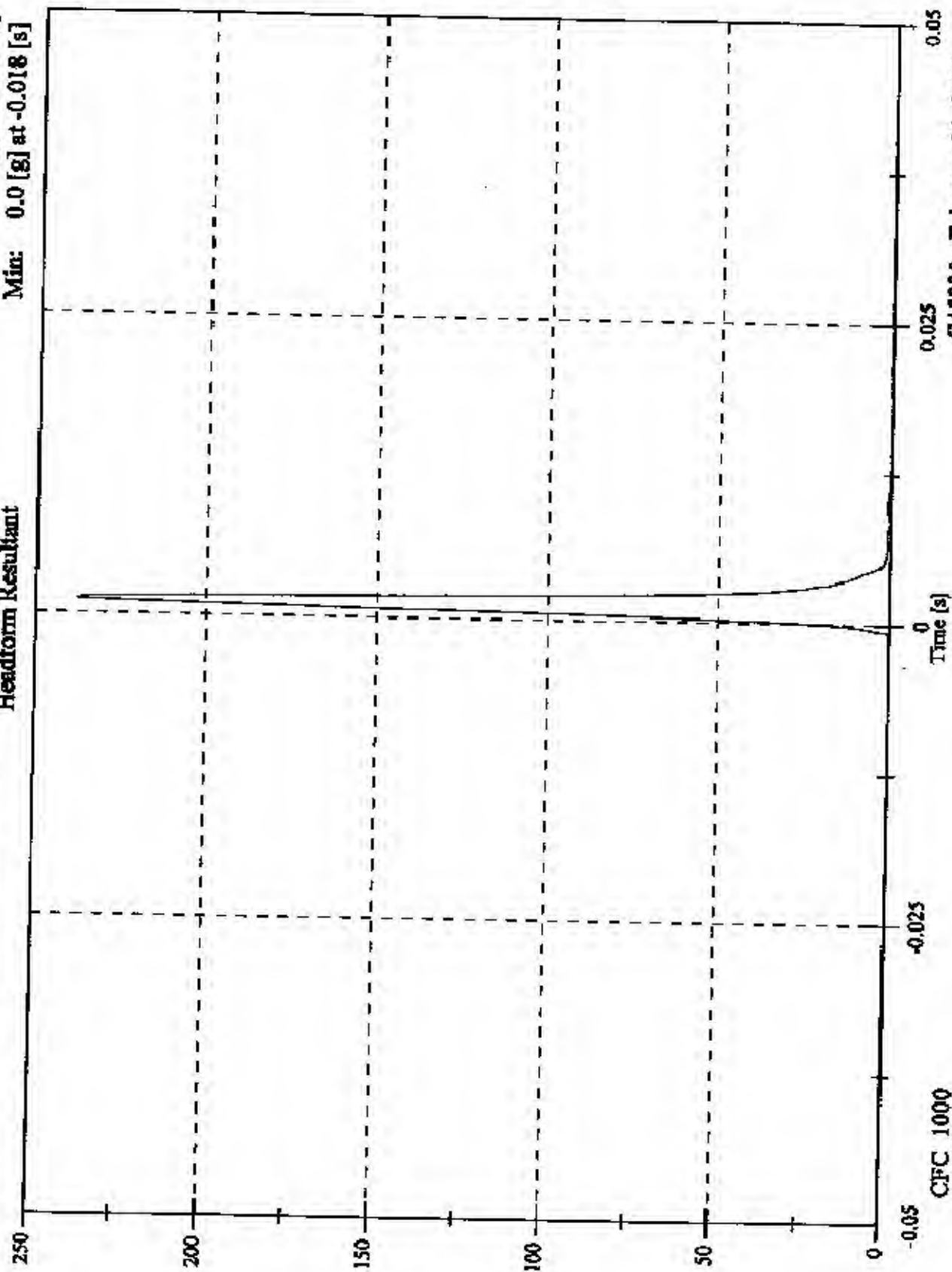
C45800 - February 20, 2004



# FMVSS 201U - Headform Calibration Drops

Max: 238.4 [g] at 0.001 [s]  
 Min: 0.0 [g] at -0.018 [s]

Headform Resultant



C45800 - February 20, 2004

**PART 572L  
HEAD DROP POST-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>
<b>SERIAL NUMBER:</b>		<b>905</b>
<b>CALIBRATION DATE:</b>		<b>February 28, 2004</b>
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>23.3</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>29</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>261.1</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>1.8</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

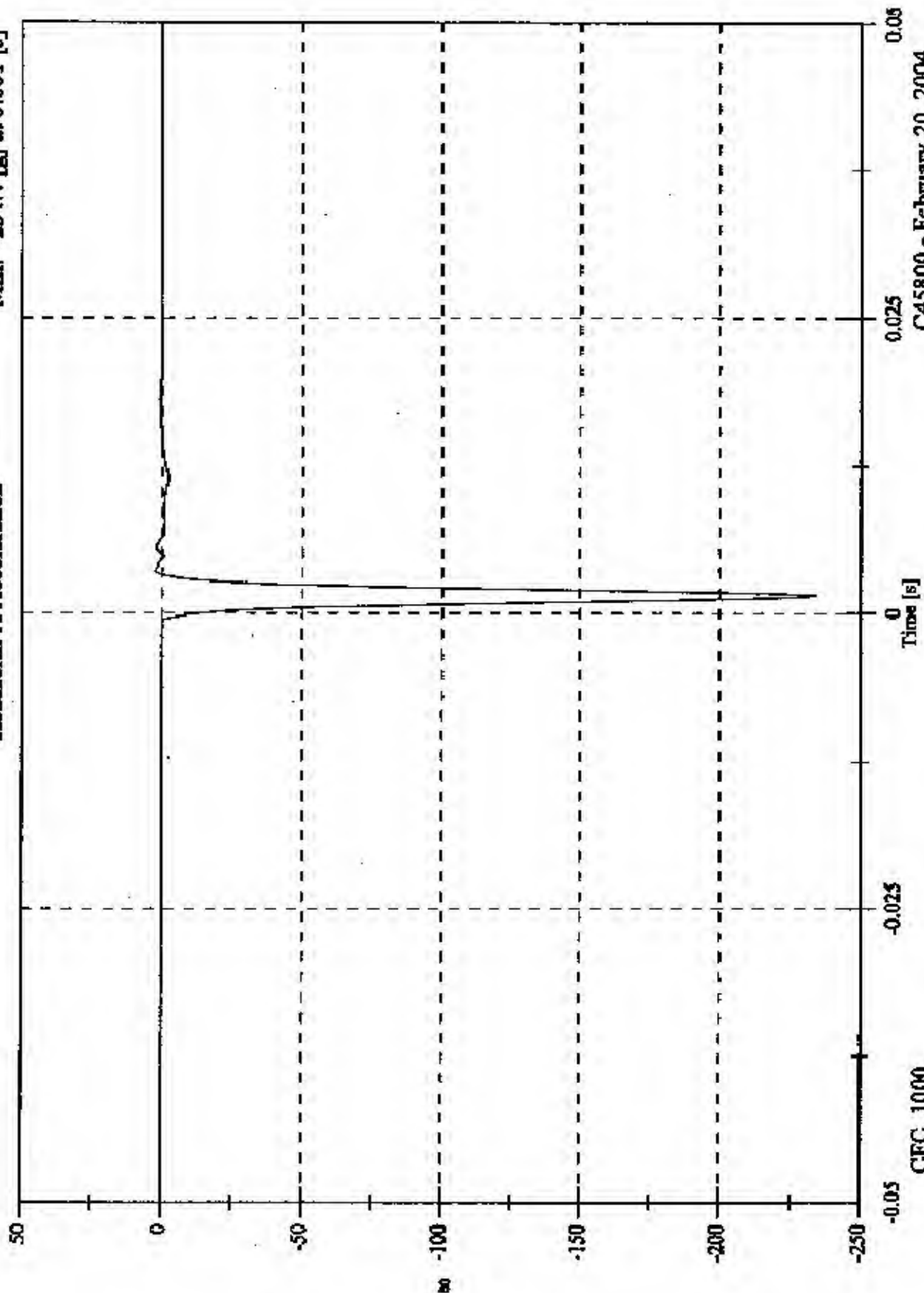
<b>LD NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J38127</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>337980</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J37854</b>	<b>08/22/03</b>	<b>02/23/04</b>

**REMARKS:**

FMVSS 201U - Headform Calibration Drops

Headform X Acceleration

Max: 2.2 [g] at 0.004 [s]  
Min: -234.4 [g] at 0.001 [s]



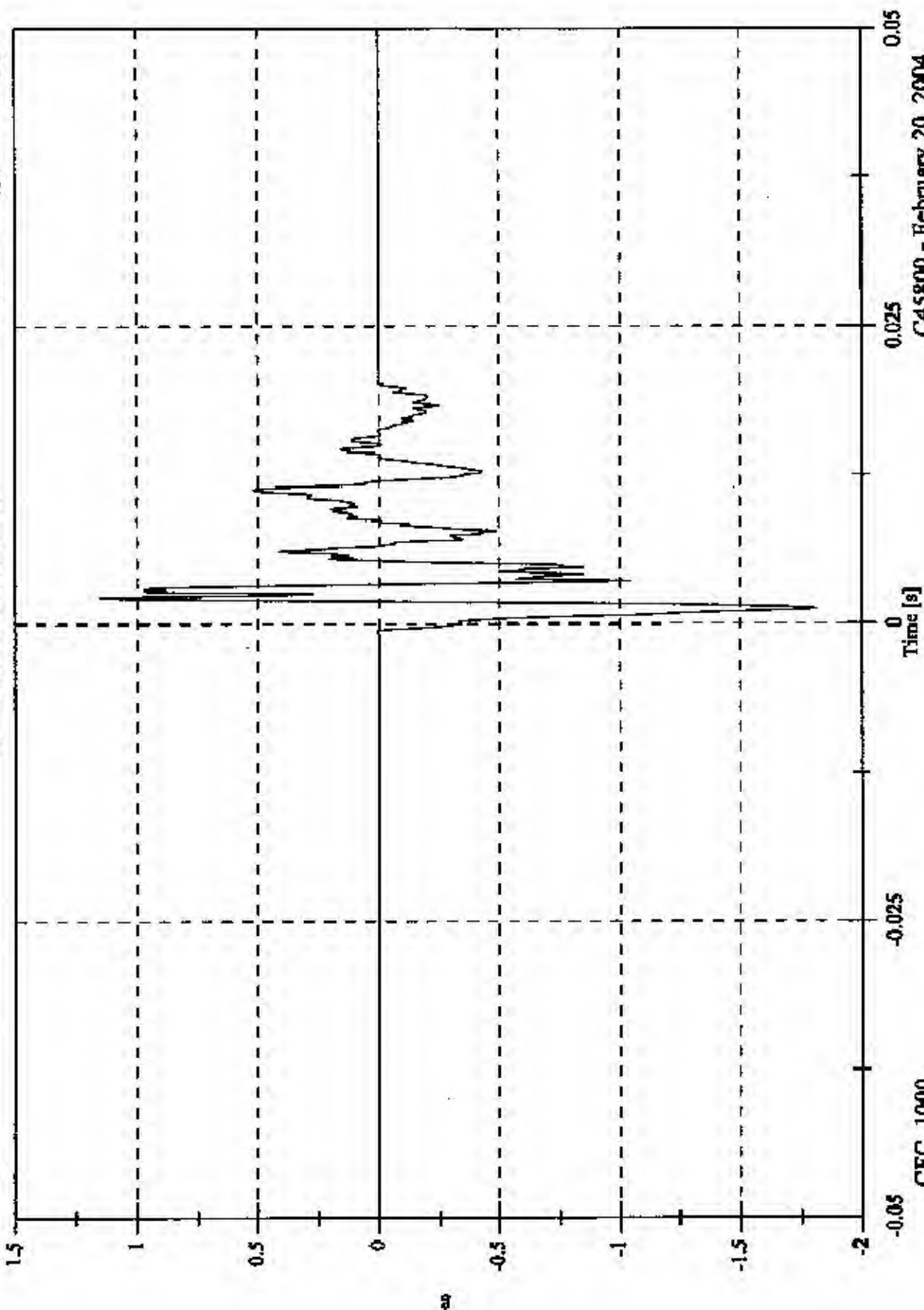
CFC\_1000



# FMVSS 201U - Headform Calibration Drops

Max: 1.2 [g] at 0.002 [s]  
Min: -1.8 [g] at 0.001 [s]

Headform Y Acceleration



CFC\_1000

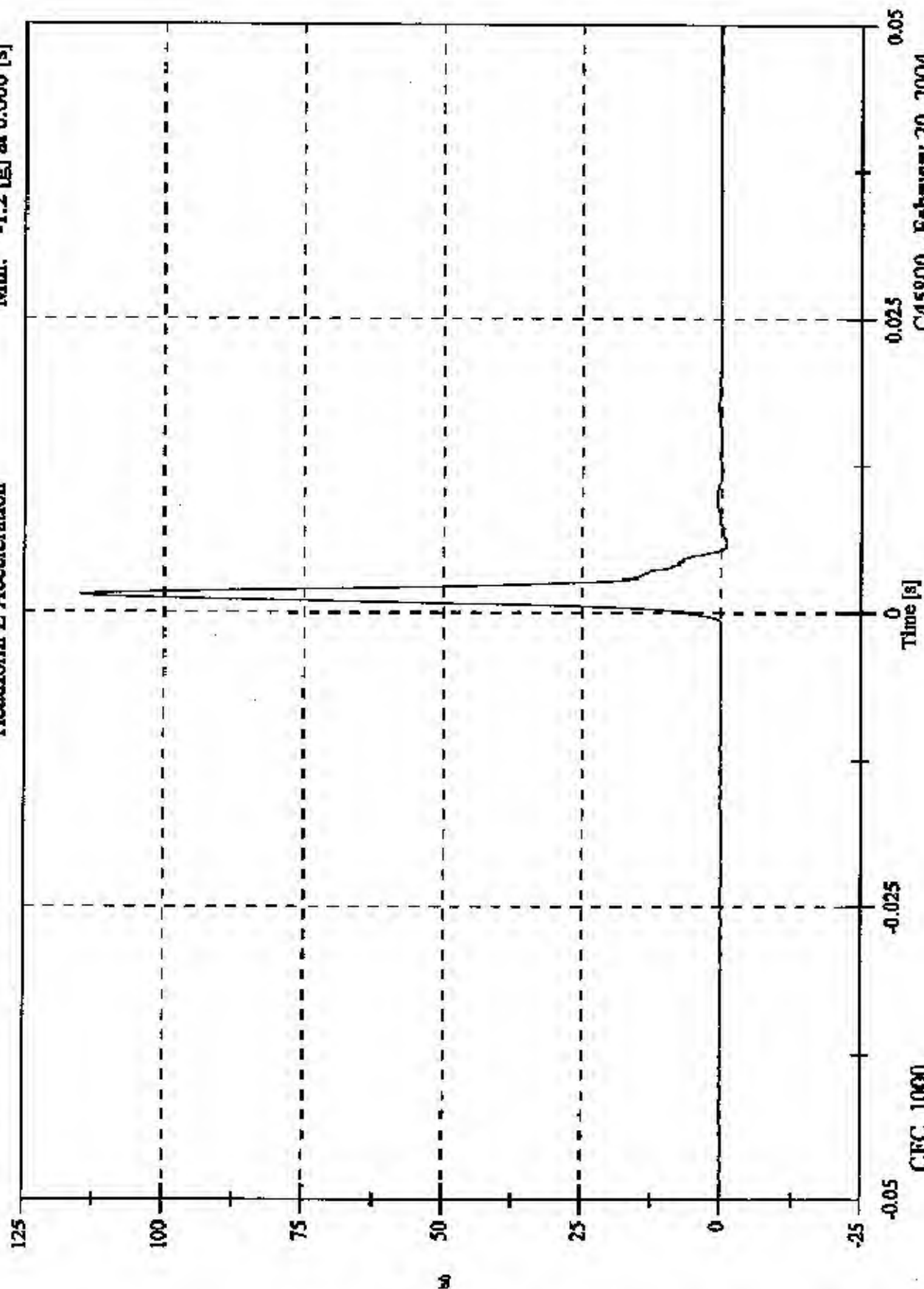
Time [s]

C45800 - February 20, 2004

FMVSS 201U - Headform Calibration Drops

Max: 115.0 [g] at 0.002 [s]  
Min: -1.2 [g] at 0.006 [s]

Headform Z Acceleration



CFC\_1000

-0.025

Time [s]

0.025

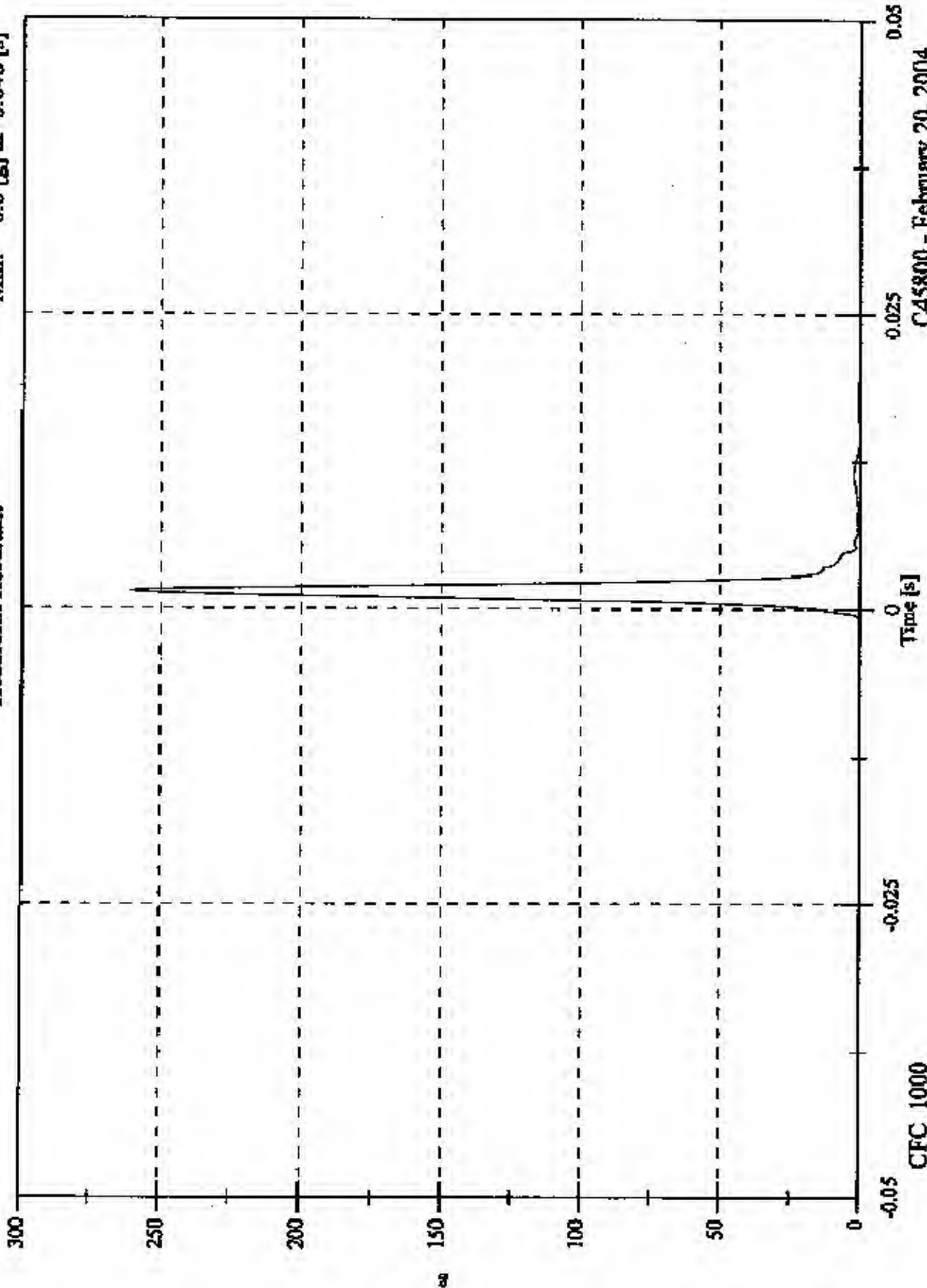
0.05

C45800 - February 20, 2004

FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 261.0 [g] at 0.001 [s]  
Min: 0.0 [g] at -0.048 [s]



C45800 - February 20, 2004



**PART 571L  
HEAD DROP POST-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>
<b>SERIAL NUMBER:</b>		<b>#383</b>
<b>CALIBRATION DATE:</b>		<b>February 20, 2004</b>
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>23.3</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>29</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>325 Gs to 275 Gs</b>	<b>249.5</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>3.5</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

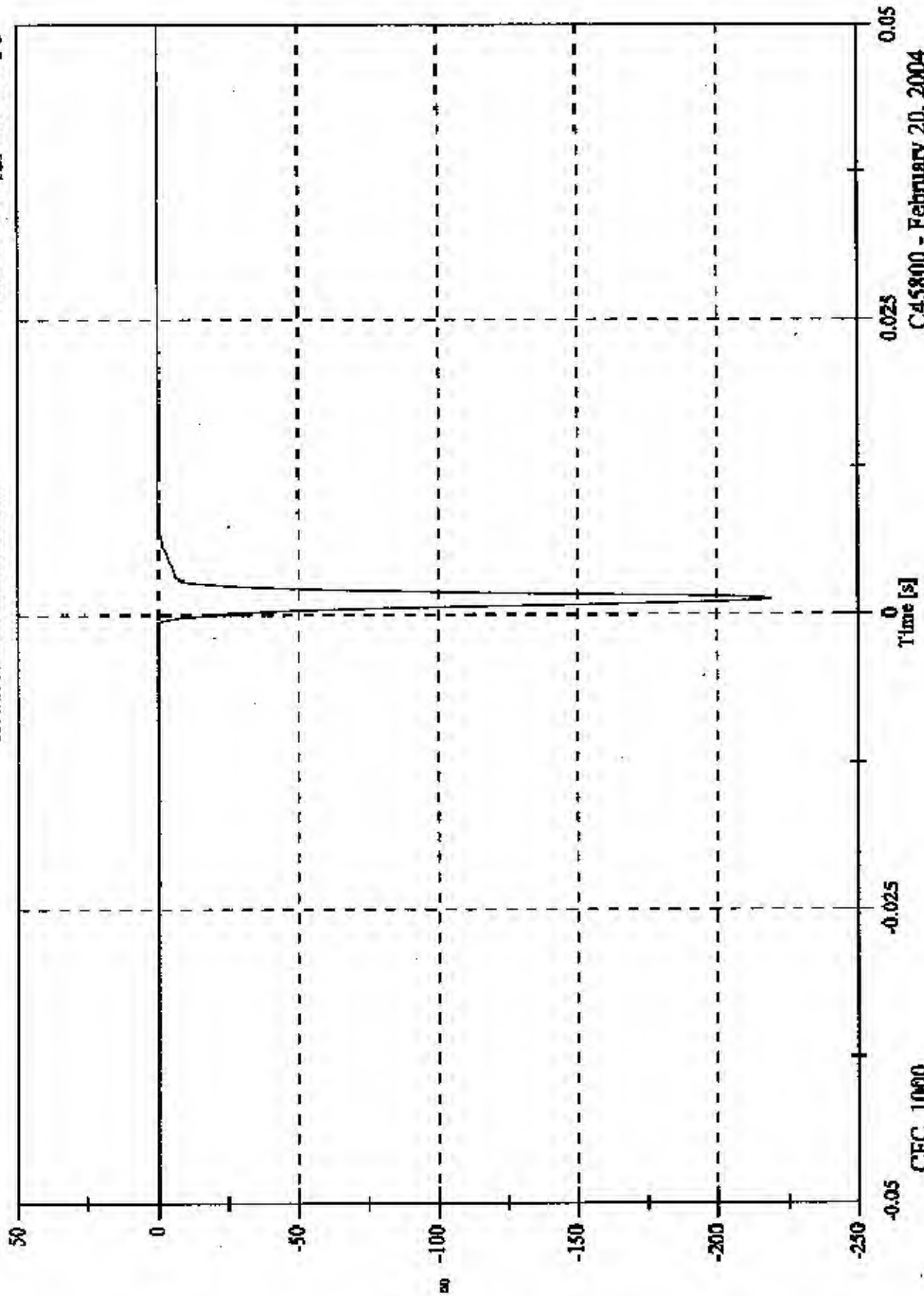
<b>ID. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J28671</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J22779</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J25854</b>	<b>08/22/03</b>	<b>02/23/04</b>

**REMARKS:**

FMVSS 201U - Headform Calibration Drops

Max: 0.3 [g] at 0.010 [s]  
Min: -219.2 [g] at 0.001 [s]

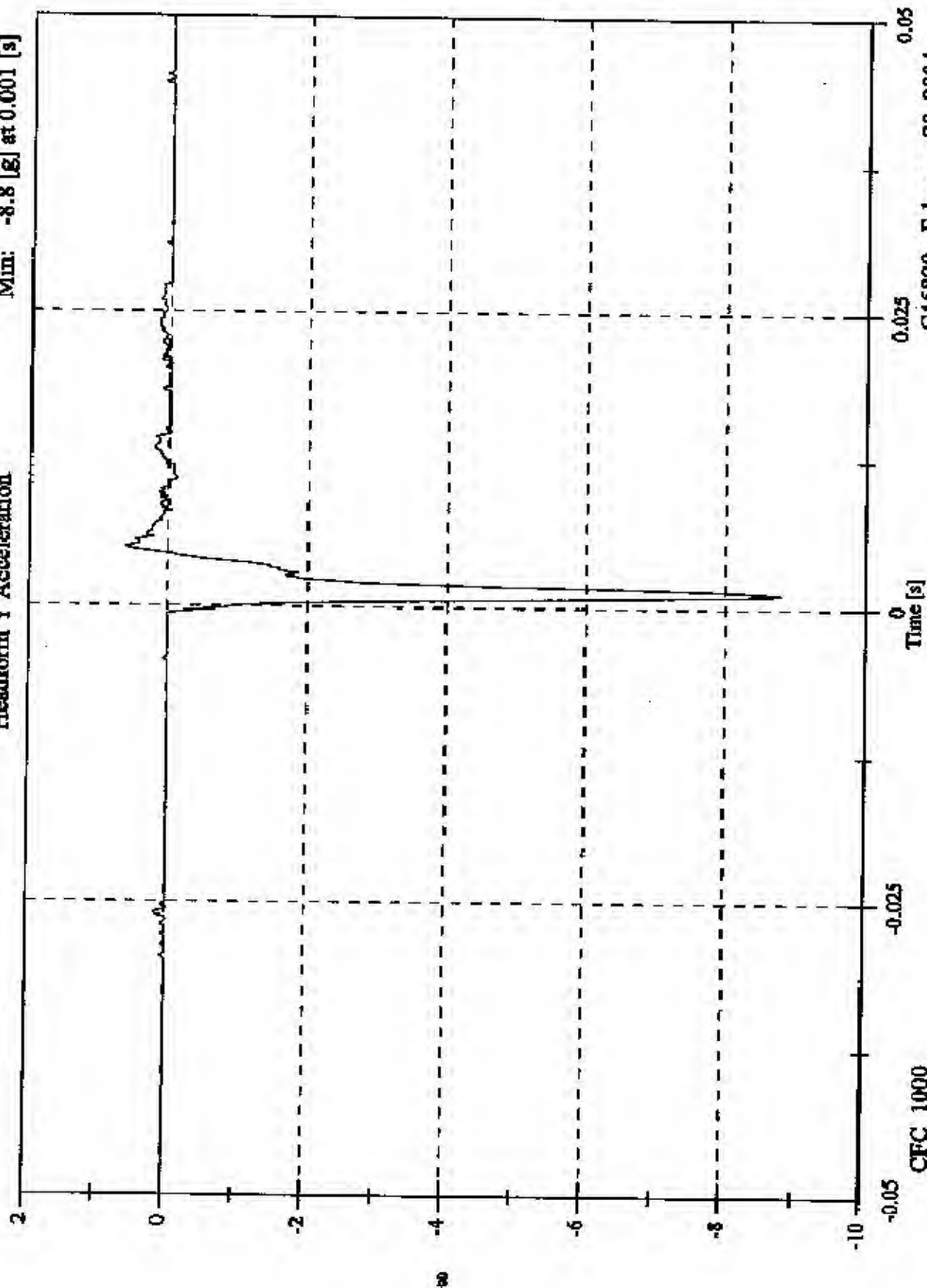
Headform X Acceleration



# FMVSS 201U - Headform Calibration Drops

Max: 0.6 [g] at 0.005 [s]  
Min: -8.8 [g] at 0.001 [s]

Headform Y Acceleration



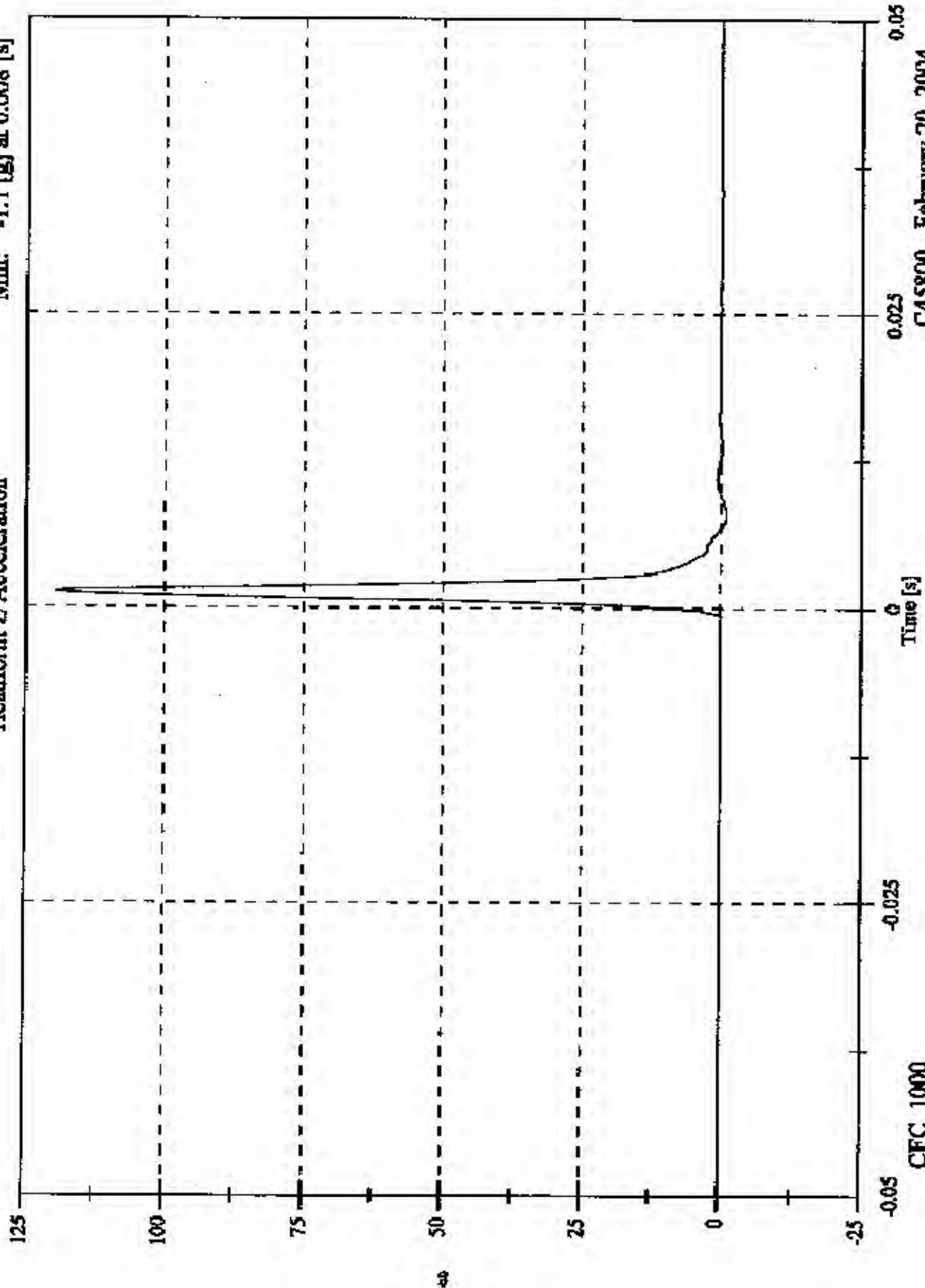
C45800 - February 20, 2004



# FMVSS 201U - Headform Calibration Drops

Max: 119.5 [g] at 0.001 [s]  
Min: -1.1 [g] at 0.008 [s]

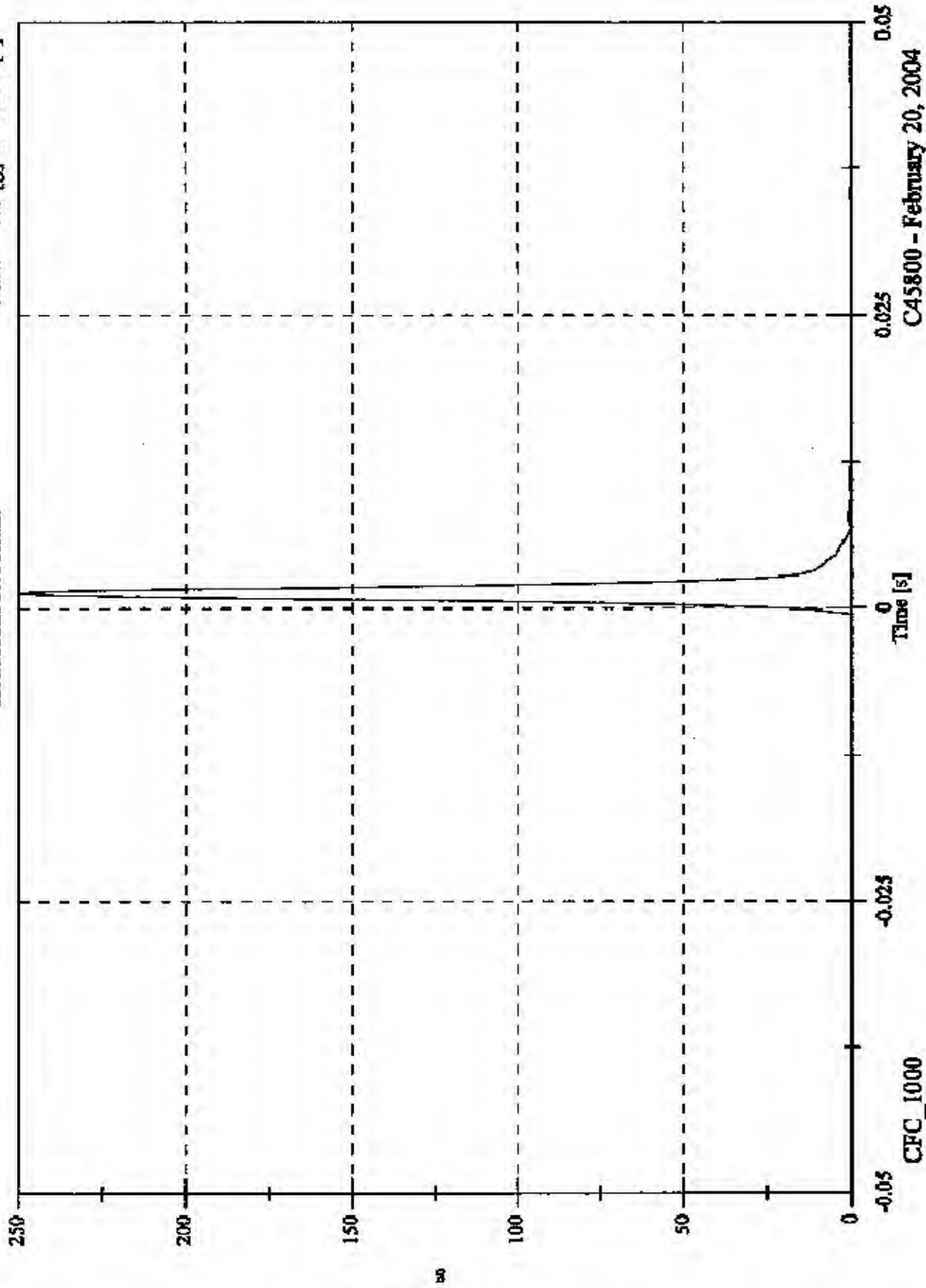
Headform Z Acceleration



FMVSS 201U - Headform Calibration Drops

Max: 249.5 [g] at 0.001 [s]  
Min: 0.0 [g] at -0.027 [s]

Headform Resultant



CFC\_1000

-0.025

0

Time [s]

0.025

C45800 - February 20, 2004

**PART 572L  
HEAD DROP POST-TEST**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>
<b>SERIAL NUMBER:</b>		<b>1255</b>
<b>CALIBRATION DATE:</b>		<b>February 20, 2004</b>
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>23.3</b>
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>25</b>
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>256.7</b>
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>9.6</b>
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>ID NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J41006</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J40994</b>	<b>08/22/03</b>	<b>02/23/04</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J41007</b>	<b>08/22/03</b>	<b>02/23/04</b>

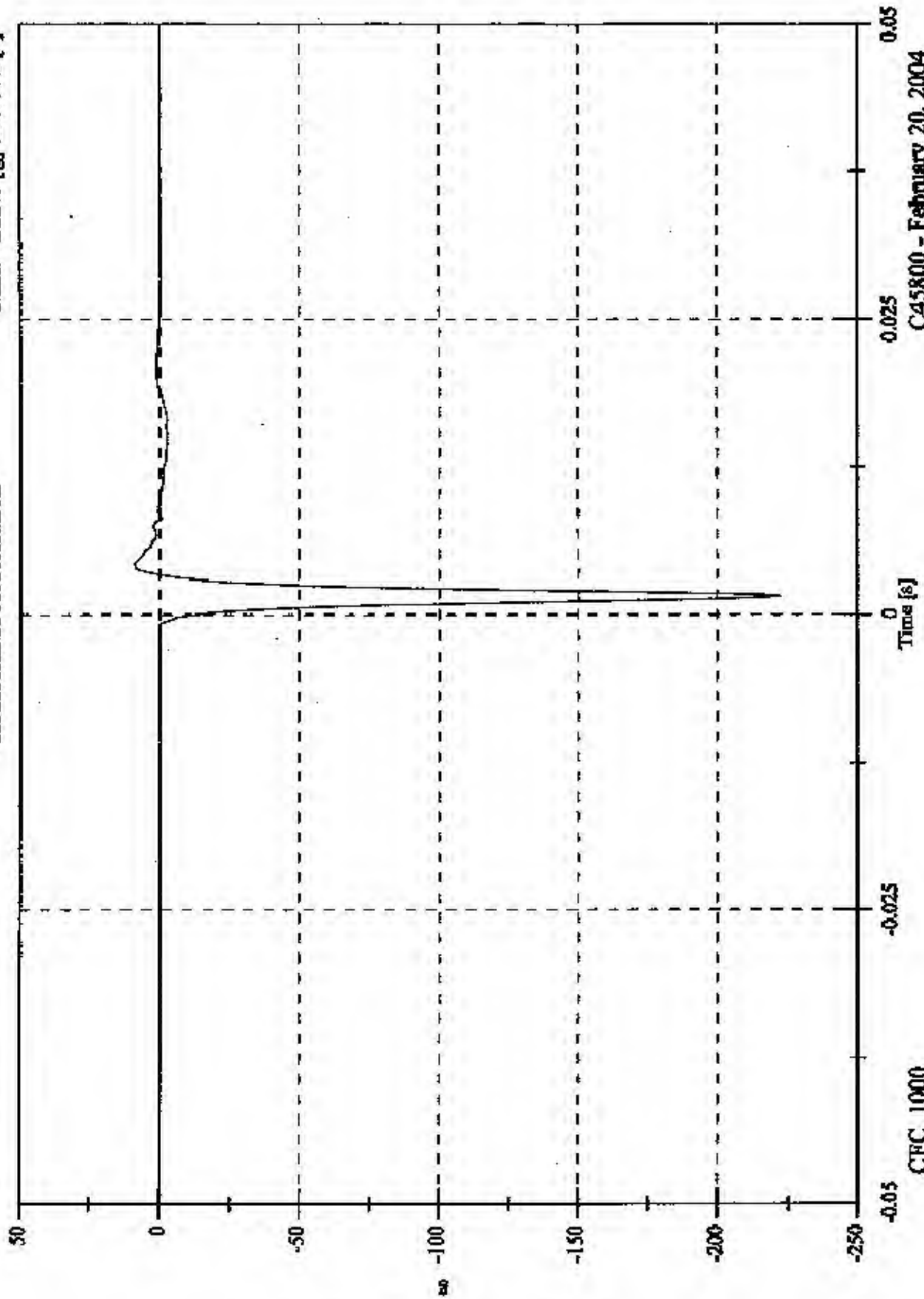
**REMARKS:**



# FMVSS 201U - Headform Calibration Drops

Max: 8.8 [g] at 0.004 [s]  
 Min: -222.0 [g] at 0.002 [s]

Headform X Acceleration

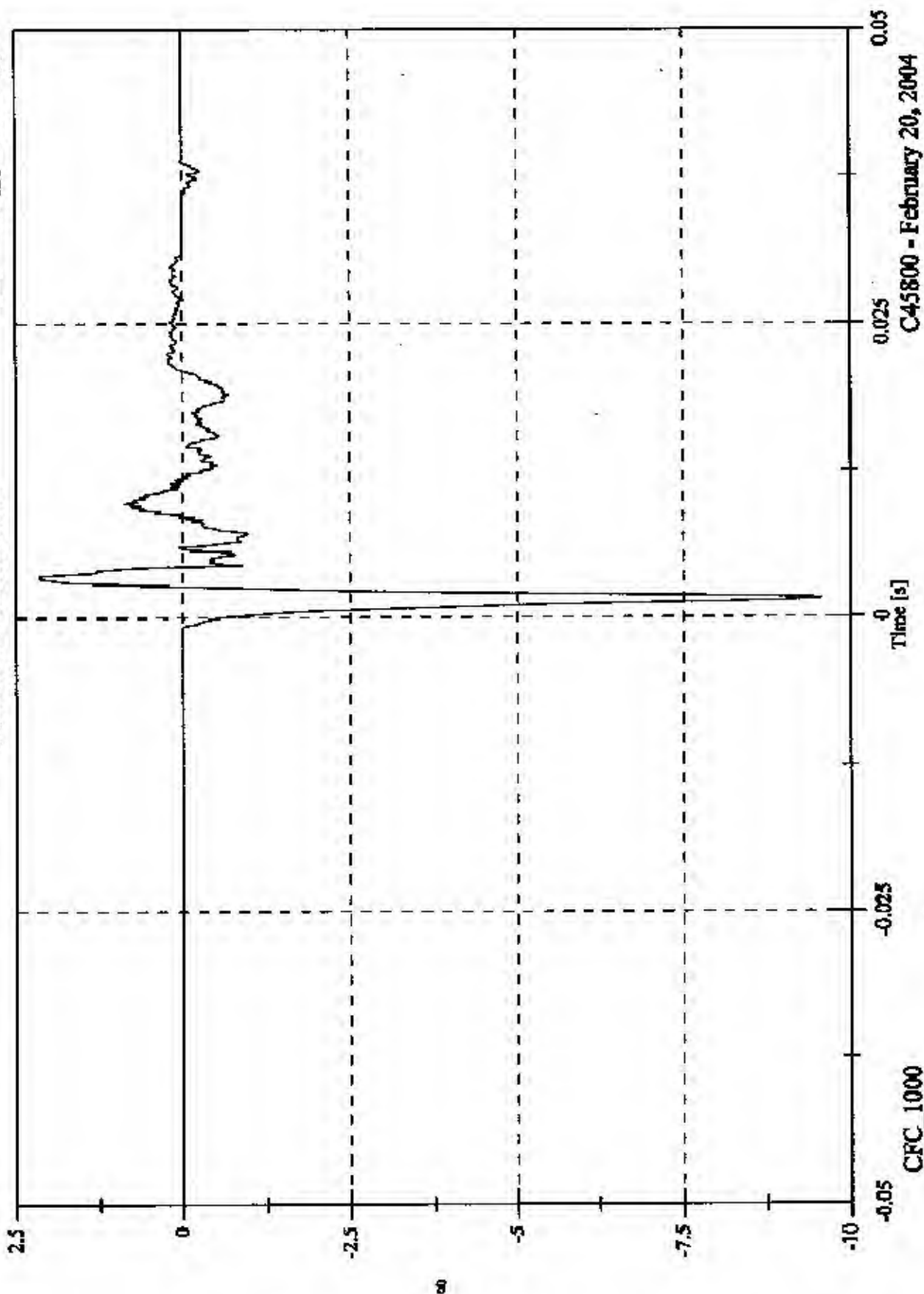


C45800 - February 20, 2004

# FMVSS 201U - Headform Calibration Drops

Max: 2.2 [g] at 0.003 [s]  
Min: -9.6 [g] at 0.002 [s]

Headform Y Acceleration

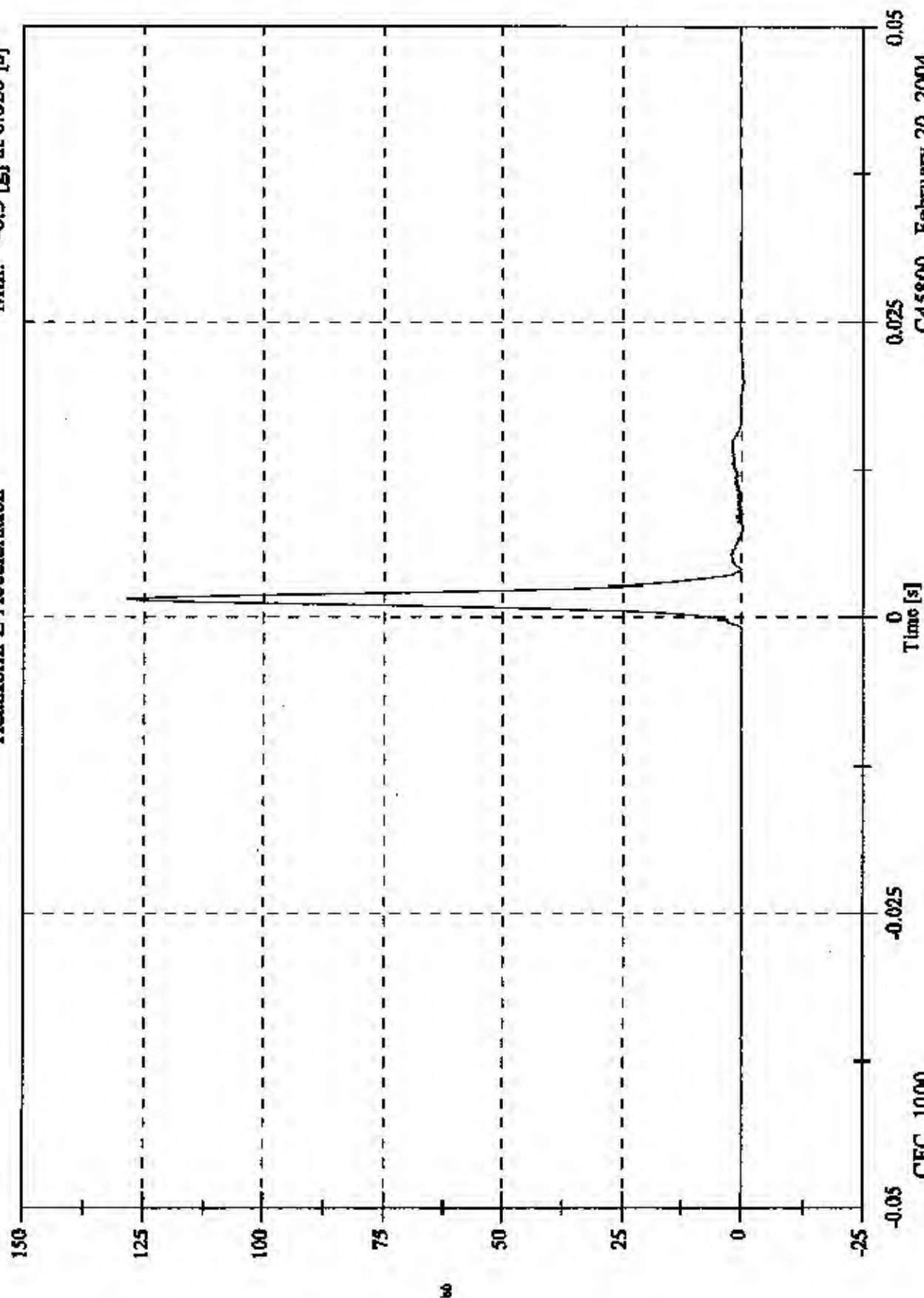


C45800 - February 20, 2004

# FMVSS 201U - Headform Calibration Drops

Max: 128.5 [g] at 0.002 [s]  
Min: -0.5 [g] at 0.020 [s]

Headform Z Acceleration

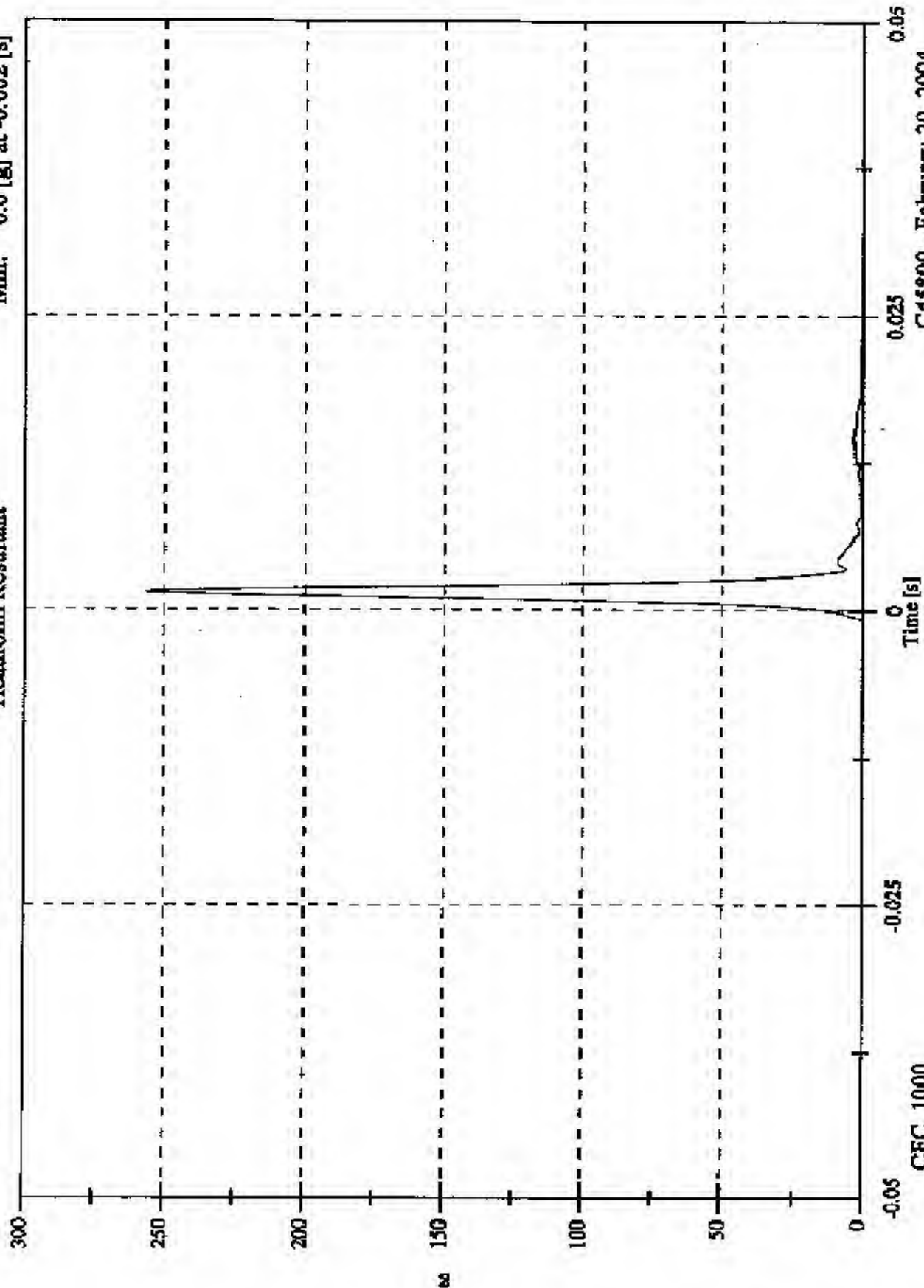




# FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 256.7 [g] at 0.002 [s]  
Min: 0.0 [g] at -0.002 [s]



CFC\_1000

-0.025

0.025

0.05

Time [s]

C45800 - February 20, 2004